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## PERIDUODENITIS*

### A Discussion of Its Causes, Types, Symptoms, Diagnosis, and Treatment.

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The presence of adventitious peritoneal membranes, bands and adhesions in the lower abdomen has been a frequent topic for discussion among abdominal surgeons for a number of years. More recently our attention has been attracted to the pathologic and clinical significance of a somewhat similar condition which is found quite frequently about the gallbladder and the descending portion of the duodenum. These adhesions are sometimes noticed rather incidentally during abdominal exploration, in the absence of any preoperative sign or symptom pointing to the gastroduodenal or biliary tracts. At other times they are found attached to the duodenum, pylorus, cystic duct, or gallbladder in such a manner as to indicate definitely that they have had a causative influence on the symptoms, for the relief of which the patient is being operated. In the latter case it is essential for the best postoperative results that the surgeon be well informed both about the pathologic anatomy involved and about the therapeutic methods available for the patient's relief. The medical diagnostician also must keep these abnormalities in mind during the examination of patients with epigastric symptoms or his conclusions will not always be based on sufficient premises.

Among the many who have added instructive chapters to our knowledge of abnormal peritoneal membranes, Bryant[1] made a very important contribution by his postmortem examinations of some 300 subjects, including all ages from the prenatal to the senile. He found abnormal peritoneal bands and adhesions existing in all of the eighteen male and in fourteen of the sixteen female fetuses examined. After birth there was a general decrease in adhesions until about the age of forty when a definite increase seemed to take place. But his most important observation, to my mind, was the fact that most of these abnormalities in the fetus were located in the right upper abdomen, i. e., on the gallbladder, duodenum, and transverse colon. Bryant concluded that this is due to a failure of normal disappearance of the anterior primitive mesentery at the time when the lesser omentum and the gastrohepatic ligament are being formed.

The duodenum is affected by the dextrad rotation of the upper abdominal organs probably more than any other organ concerned in this prenatal readjustment[2]. Its entire right surface and the lower half of the left become permanently attached to other structures during the rotation, after having been previously free except for the anterior and posterior mesenteric attachments. The transverse mesocolon and the mesenteric root attach themselves more or less tightly across the front of the duodenum while the posterior surface becomes adherent to the back. The colon seems to be erratic in its efforts to become attached in the right upper abdomen and often clings to the duodenum so tightly during the rotation that it is unable to let go at the proper time. As a result many individuals go through life with the cecum and ascending colon hanging from fibrous attachments on or about the second portion of the duodenum (Fig. 4, C).

During the colonic rotation in the fetus the transverse mesocolon does not always become attached across the duodenum at the same distance from the pylorus. Patients with severe digestive disorders are seen from time to time in whom the duodenal segment of the intestine is found by fluoroscope, or by exploration, to be excessively long (Figs. 1 and 2). The second portion producing a zigzag or loop formation above the mesocolon, not only seems to be of an abnormal length, but the third portion also may be seen to form an unusually long curve below the mesocolon. Haberer[3] called attention to this submeso-

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colic duodenal abnormality, but he did not mention its occurrence above the transverse mesocolon. As a rule we do not examine healthy individuals and we do not know how often such abnormalities may be compatible with symptom-free digestion. But some measure of clinical significance must be ascribed to my observation that certain operative procedures serving as physiologic relief for unusually long and obstructed duodenal loops will remove epigastric distress and restore patients to digestive health.

stated positively whether or not the later introduction of bacteria into the intestine and the absorption of their toxins from a retention in a duodenal loop add materially to the local pathology, but we may safely assume that bacterial toxins help to increase the toxemic symptoms produced by a fully developed duodenal retention.

With all these facts before us it is easy to visualize the possibility of a congenital origin of a duodenal disfunction which later may cause re-

Fig. 1. Essential periduodenitis deforming the entire supramesocolic duodenum; abnormal length of duodenum producing a loop toward the right above mesocolon; epigastric distress, anorexia, loss of weight, bile emesis; disappearance of all symptoms after transmesocolic duodenojejunostomy, except occasional nausea after meals.

The development of the digestive juices[4] begins even before birth and their presence and activities are emphasized most strongly in the upper part of the intestine. Clinical and experimental evidence both have shown that toxic substances may be absorbed from the intestinal mucosa and that the toxicity of the duodenal juices exceeds that of any other segment of the entire gastro-intestinal tract. It cannot yet be

tention and irritation and perhaps even infection of the duodenal wall, and consequent interference with the normal development of the duodenal peritoneum.

The term "periduodenitis" is a recent acquisition in medical terminology. Under this name are comprised not only all the abnormal membranes and adhesions about the first, second, and occasionally the third, portions of the duodenum

which are of developmental or infectious origin, but also the postoperative adhesions involving the duodenal serosa. It seems that Professor Pierre

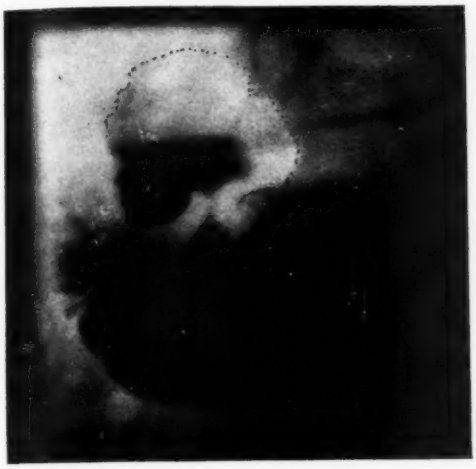

Fig. 2. Abnormal length of duodenum; upper part of second portion forming a loop filled with gas in front of stomach; from patient with marked digestive troubles—resembling duodenal ulcer; relieved from postural treatments (no operation).

Duval of Paris, who first studied these abnormalities extensively, established the term[5]. He also classified the lesion under two main headings and gave the name "pericholecysto-duodenitis," or "biliary periduodenitis," to those cases in which the duodenal adhesions were attached to the gallbladder or cystic duct (Fig. 3). He applied the term "essential periduodenitis" to those cases in which the adhesions, bands, veils, mem-

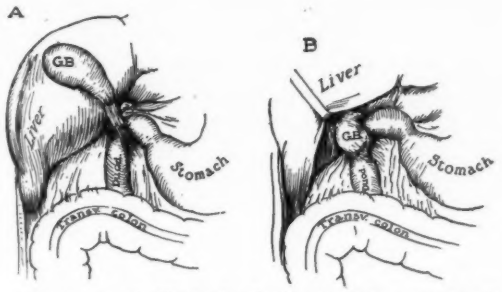


Fig. 3. A. Periduodenal adhesions involving gastrohepatic ligament and deep segment of gallbladder—Pericholecysto-duodenitis.
B. Pericholecysto-duodenitis, extreme degree, gallbladder firmly attached across second portion of duodenum.

branes, or "cob-webs" were found on the duodenum, but not involving the gallbladder or ducts, although extensions of the abnormal structure might reach to the liver, stomach, omentum, transverse colon, or posterior abdominal wall (Fig. 4, A and B). He specified for the "essential" type also that no inflammatory or other lesion of any kind was to be found in the duodenum, gallbladder, pancreas, or other neighboring organs as a possible cause for the adhesions. This division into two types is very convenient for topographic reasons, but it is my belief that in very many instances where there has been no previous operation, the condition is fundamentally one and the same thing, whether the

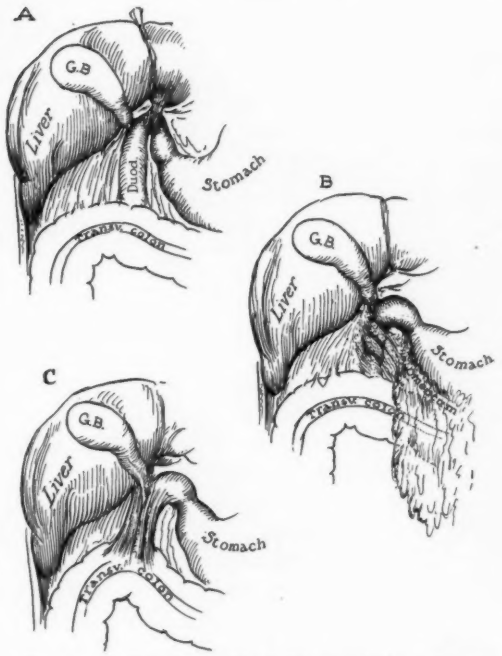


Fig. 4. A. Essential periduodenitis, restricting and stenosing adhesions from duodenal bulb and first portion to liver.
B. Essential periduodenitis, the second portion held in a loose membranous sheath.
C. Thick periduodenal bands forming a ligamentous structure from which the right colon is supported: right phrenocolic ligament absent.

adhesions are confined to the duodenum, or involve the gallbladder or other contiguous structures.

Periduodenal adhesions which appear and produce epigastric symptoms after operations do not properly belong to the pathologic conception of periduodenitis now under discussion. This contribution to the subject is based chiefly on personal observations of periduodenitis of Duval's "essential" type on the first and second portions of the duodenum. He mentioned also a similar condition occasionally found on the third portion

of the duodenum[5]. Its symptoms and signs correspond very closely to those of chronic duodenal obstruction at the mesenteric root, a condition already discribed by me and many others. It does not seem important to differentiate clinically the two conditions, since the treatment is the same for both.

A description of the gross appearance of the periduodenal membranes which are found in periduodenitis is very difficult, for the reason that one rarely sees two patients in whom the tissues concerned have the same arrangement. In some cases there are firm bands uniting one or more small areas of the duodenal wall to the liver, lesser omentum, or posterior abdominal wall, while in other cases the membrane seems to cover the entire descending duodenum with here and there tighter bands causing localized restrictions on the bowel lumen. It is more important to emphasize the clinical significance of their presence than to discuss the many varieties of periduodenal membranes. Although there is a certain similarity between the abnormal membranes found on a hypermobile right colon and those on the duodenum, the former have a more uniform and more purposeful anatomic arrangement, and they are not nearly so restricting and disabling to the function of the intestine as are their periduodenal courterparts[5].

Several cases of essential periduodenitis associated with a marked hypermobility of the pylorus and duodenum have come under my observation. The periduodenal membrane in such patients is exceedingly thin and forms a complete covering or sheath to which the second portion is attached very loosely, permitting exceptionally free movements of the entire supramesocolic duodenum. The membranes in these cases rarely have any connection with the biliary tract. A number of small bright red blood vessels coming from the omental margin run transversely within the sheath and do not appear to anastomose with the duodenal vessels proper. This sheath formation has been present to a lesser or greater extent in all cases of those abnormally long duodena which we have explored surgically.

Since essential periduodenitis must be assumed to be largely of congenital or developmental origin it follows that, as a rule, the symptoms produced begin in early life. An adult patient rarely appears seeking relief for the first time from digestive difficulties which have begun after adolescence. The history usually shows that there had been a series of milder spells of indigestion and epigastric pain, beginning between the fifteenth and twentieth years, or even earlier. On inquiry it is often found that dyspepsia of some form is well known to other members of the family, this again points to an inborn tendency. The female is afflicted more often than the male.

The patient's *symptoms* will indicate in a general way which organic function, or functions, suffer most from the adhesions[5 6 7 8]. When these are locatel chiefly about the gallbladder and the cystic duct, the clinical picture may be impossible of differentiation from those of cholecystitis. If the pyloric region is chiefly involved the syndrome resembles that of duodenal or gastric ulcer. Symptoms which may be called typical of periduodenitis are produced in some cases in which the membranes are confined to the descending duodenum. But even though the symptoms are very suggestive in such cases, a positive preoperative diagnosis of periduodenitis is not to be expected in any case without the aid of expert roentgenologic knowledge.

Some patients have definite attacks of pain in the right upper abdomen, often radiating toward the back as in disease of the biliary system[5]. The pain and distress may last several days and be followed by periods of good health. However, a carefully taken history will show that the symptoms are not so severe as in typical gallstone colic; that they last longer; and that they are associated with nausea and often with emesis. After a number of these attacks the patient usually comes to a surgeon and is operated for cholecystitis. At operation the gallbladder is probably found attached more or less firmly to the duodenum with adhesions which seem to confirm the diagnosis of cholecystitis. In accordance with prevailing practice cholecystectomy is made. Postoperative examination of such gallbladders has shown that the muscular and mucous coats may be quite normal and free from the usual signs of infection. There is not the round cell infiltration expected to be present, a few days after an acute attack of true cholecystitis. An increase in fibrous tissue may be present where the adhesions have been cut while the rest of the wall is practically normal.

In cases of firm union between the gallbladder and the duodenum, it is noticed that while the gallbladder is being cut free, the duodenum becomes more and more liberated from the confining bands of adhesions and bulges freely forward. This gives the distinct impression that the adhesions have had a constricting effect on the duodenum, that the duodenal caliber has been definitely reduced, and that normal duodenal function could not take place under the tightly drawn adhesions. In such cases the patient's relief from symptoms after cholecystectomy, if relief there be, is probably due more to the liberation of the constricted and obstructed duodenum than to the removal of the gallbladder itself. It is, of course, understood that this statement has no reference to cases of true infection of the gallbladder in which pericholecystic adhesions are so well known.

Another confusing set of symptoms caused by periduodenal membranes is presented by patients who have distress after meals[5]. The discomfort may be almost as regular as in typical duodenal ulcer. Although the distress may differ from ulcer pain in that no relief is obtained from food or alkalies, it is not possible to rule out ulcer from the clinical history alone. The picture can simulate duodenal ulcer so closely that too hasty diagnosis, especially before the time when competent roentgenologic judgment became available, to my personal knowledge and humiliation, occasionally has led to misdirected surgery.

There are, however, patients who present what may be termed a typical syndrome of periduodenitis of the supramesocolic, "essential" type. The following case history chosen out of several which are more or less similar will serve as a good example:

The patient was a young woman of twenty-four years, a saleslady in a dry goods store. Her father, now dead, had suffered from chronic stomach trouble all his life and had had frequent vomiting spells. As a child, she had a "weak stomach," and at the age of adolescence she began to have occasional "bilious spells," which means that she had attacks of headache, general malaise, nausea, and vomiting of bile. A few years later she noticed a gradually oncoming sensation of fullness in the epigastrium and often nausea after meals. Vomiting of bile had taken place on many occasions. There had never been any real pain in the epigastrium, but the distressing sensations of fullness and nausea, seemed to increase in frequency and intensity. Constipation had required the constant use of laxatives during the last three years. The taking of an enema always produced emesis.

But more disabling than any of the symptoms described were attacks of severe headaches which had appeared three or four years ago and had gradually become more intense. These headaches came every two or three weeks and were described by the patient as "blinding" in character, her vision each time becoming entirely blurred for hours. The headache always wound up with nausea and emesis and was followed by general weakness and malaise for several days. In the past few months she had noticed a painful stiffening in her joints, especially in the lower extremities. She was depressed mentally, introspective, and suffered from insomnia.

She was obliged frequently to leave her work and go home to bed, chiefly because of the headache which did not respond to any form of treatment. She had consulted a number of medical advisers, charlatans among the rest, but all treatments, including an appendectomy, had failed to stop the progress of her ailments.

The physical examination of this patient with such a definite history of chronic digestive disturbance was remarkably negative. Her appearance was somewhat anemic, otherwise normal. The only abnormality found by palpation was a tenderness in the right hypochondrium, and a hypermobile right colon. Examinations of gastric juice, urine, and blood showed nothing abnormal except a slight secondary anemia. Definite information was given, however, by means of fluoroscopic examination, and the positive x-ray findings together with the characteristic clinical history led to proper diagnosis and successful operative treatment.

The history related above brings out the two most important clinical signs of essential periduodenitis, namely: first, retention of the duodenal contents, producing local discomfort, nausea and emesis, and second, evidence of a toxemia as shown by the headaches and other general symptoms.

Toxic absorption from duodenal retention seems to be especially prone to bring on symptoms of a nervous nature[5 8]. Besides the almost uniform complaints of headache, a profound mental depression usually called neurasthenia often takes possession of the patient. The occurrence of multiarticular pains, which together with the other symptoms disappeared soon after operation, was an observation in the case reported not seen in any other instance, but it indicates the toxic effects of retained duodenal contents.

It should be kept in mind that the symptoms, both local and general, are produced by the abnormal retention within the duodenum of a quantity of toxic material beyond the physiologic time for emptying.

Clinical experience leaves no doubt that the presence of abnormal adhesions on the peritoneal surfaces of the duodenum causes this duodenal disfunction. The perverted and ineffective peristalsis and the abnormal duodenal retention may be visualized by the fluoroscope before op-

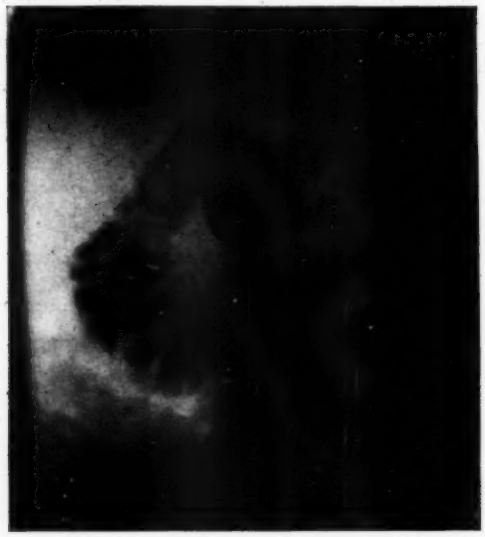

Fig. 5. Normal duodenum forcibly distended with barium to show outline.

eration. After the adhesions have been removed or their effects minimized by surgical technic, the duodenum is seen to functionate more normally and the patient's former symptoms disappear.

The duodenum was not intended to be a resting place for anything in particular. It was made for a passageway and not for a store-room. A duodenum able to complete the passage of its contents from pylorus to jejunum in eight or ten seconds produces no discomfort to its owner. A duodenum requiring several minutes for the same act has a dyspeptic owner, while a completely obstructed duodenum causes the owner's death in a few hours.

There are without question other causes for the syndrome of biliousness associated with headache beside periduodenitis and other forms of chronic duodenal obstruction. Certain endocrine disturbances of obscure nature are undoubtedly causative factors in some cases, while in others duodenal antiperistalsis is induced through reflex routes. But with a good understanding of duodenal retention as well as of duodenal ulcer and biliary disease, there will be a very material decrease in the number of cases of hitherto unexplained epigastric disturbances.

In the roentgenologic examination for periduodenitis, observation before the fluoroscopic screen gives the most important evidence of the disease [5 9]. Films are not nearly so instructive, first, because the barium-filled stomach often overshadows a large part of the duodenum, and second, because it is very difficult to photograph the rapidly changing contours assumed by the duodenum. In the normal duodenum the rapid transit of the contents prevents, as a rule, the formation of any definite shadow in the second and third portions (Fig. 5). In duodenal obstruction, whether from periduodenitis or other cause, the contents are retarded long enough for the duodenal outline to be visualized (Figs. 6, 7, 8 and 9). In some cases it may be found that

Fig. 6. Duodenal obstruction at mesentric root; no periduodenal adhesion; duodenum evenly distended; constant nausea, and frequent attacks of bile emesis cured from submesocolic duodenojejunostomy.

the duodenum is more or less filled throughout the period of gastric emptying. In periduodenitis energetic peristaltic and antiperistaltic movements are noted and points of abnormal and permanent fixation may be located. The duodenum seems to struggle against the restricting fibers and membranes, suggesting the movements of a fish caught in a landing net. In our experience

every duodenum which presented these struggling or writhing movements, and in which surgical exploration was made, abnormal membranes were found on the second portion, or on the first and second portions.

For accurate diagnosis and proper treatment of periduodenitis, an understanding and cooperative interest from the roentgenologist is a necessity. The internist can at best make only a tentative diagnosis of periduodenitis and duodenal retention in typical cases. It lies within the domain of roentgenology to clear up the confusion and to make the diagnosis fairly exact in the majority of cases. Very few roentgenologists have as yet acquired the necessary knowledge for this work. Perhaps this is our own fault. When the surgeon, and more especially the internist, begins to make more specific inquiries into the finer de-

Fig. 7. Pericholecysto-duodenitis; gallbladder found tightly adherent across duodenum; note deformity of bulb and nearly complete stenosis.

tails of the duodenal appearance and behavior before the fluoroscopic scheen, the roentgenologist will soon fall into line, and if he is the right sort, he is apt to becomethe leader in the search for evidence of periduodenal adhesions and of pathologic duodenal retention.

So far as *treatment* of this condition is concerned, it makes little difference whether we consider the periduodenal adhesions of developmental or of inflammatory origin, or indeed if we assume that they are but end products from chronic stasis in the colon, as certain authorities would have us believe. Experience has proved abundantly that the local periduodenal lesion is

Fig. 8. Essential periduodenitis, second portion entirely covered with membrane; side view; frequent headaches, periodic attacks of distress after eating, emesis of food remnants, no bile; free from all symptoms after transmesocolic duodenojejunostomy.

real, that it causes the local and general disturbances above mentioned, and that proper treatment of the local lesion does restore patients to health.

Since the pathogenic cause is primarily of a mechanical and obstructive nature, it follows that mechanical relief of the obstruction must be the main feature of any rational treatment. Prolonged rest in bed with restricted diet will afford a temporary relief in certain cases, but as a rule all former symptoms recur when the patient resumes the former mode of living. The absence of relief from epigastric trouble when the patient is put to bed in the Trendelenburg position is a characteristic which helps, in some cases, to differentiate periduodenitis clinically from chronic duodenal obstruction near the duodenojejunal junction. Postural treatments combined with abdominal pads and belts give more

or less lasting relief to the latter condition, while periduodenitis, especially of the supramesocolic type, remains uninfluenced by every change of position of body or of viscera as well as by any and all forms of internal medication.

It must be understood that while periduodenitis is of common occurrence, comparatively few have serious symptoms due to this lesion. In most cases of mild and temporary spells of sickness from this cause, medical, dietary, and palliative means alone are to be considered. But when the condition appears progressive and disabling, when the toxemic symptoms become severe, and when the x-ray has shown positively the duodenal disfunction, then surgical treatment is indicated. It should be stated also that the mere presence of periduodenal adhesions is not an indication for surgical treatment. Neither does the x-ray diagnosis by itself necessarily point to operation. Surgery should be thought of only when the clinical syndrome is of sufficient gravity to warrant radical interference.

Fig. 9. Essential periduodenitis, upper part of second portion stenosed from restricting bands and membranes (see clinical history in text; transmesocolic duodenojejunostomy; cure).

Before operating for periduodenitis it is necessary that the surgeon be well experienced in abdominal work and have thoroughly informed himself about the problems that will be encountered and the technical means to overcome them. Here, as in many other fields of medicine, no two cases seem to be exactly alike and much judgment must be exercised in choosing the proper form of treatment for the individual case.

The surgical technic followed in my work has been in the main that described by Professor Duval. I have deviated from his methods only in some minor points, the most important of which has been perhaps the use of attached omental flaps instead of free grafts as practiced at his clinic.

It had been my practice for many years to make use of omental flaps as a protection against a possible formation of adhesions in nearly every case of cholecystectomy. This technic required but slight modification to conform to the requirements of covering the denuded areas on the duodenum when operating for periduodenitis. It would seem also that whenever the attached flap is available it would offer a better assurance against faulty healing.

In secondary operations for periduodenitis following cholecystectomy, the adhesions have been loosened until the duodenum has become freely mobilized, after which the duodenal raw surfaces have been covered with attached omental flaps. In a few such cases with extensive adhesions about the pylorus and first portion of the duodenum, gastroenterostomy has been made. One patient, a woman of 57, who had been operated twice elswhere for duodenal adhesions after a primary cholecystectomy, and who had duodenal stasis, was treated with a gastroenterostomy plus a duodenojejunostomy according to Duval's method. She was a feeble invalid, suffering pain from the extensive adhesions, and headache and melancholia from the duodenal toxemia. She has enjoyed good health almost without interruption since the operation, nearly two years ago.

In cholecystic periduodenitis with the gallbladder still present, cholecystectomy has been made in all cases when the adhesions involved the greater portion of the gallbladder serosa and the liberated duodenum has been covered with omental flap. In a few similar cases where the adhesions covered only the deeper parts of the gallbladder and the ducts, or where a rather thin membrane extended to the mesial surface of an otherwise normal gallbladder, this organ was left *in situ* and the attached omental flap applied to cover the duodenum (Fig. 10).

The observation that certain adherent gallbladders may be dissected away from the duodenum and re-adherence prevented by the interposition of an omental flap and that painful

symptoms in the right hypochondrium can be cured by this rather simple treatment, has reminded me of a number of excised gallbladders which might have been preserved by this method. It also calls attention to the fact that some pericholecystic adhesions may be induced by causes entirely outside the biliary system.

In some cases of long standing obstruction and retention from cholecystico-duodenal adhesions, the duodenum seems to be unable to resume its normal emptying function, even after it has been freed, mobilized, and protected by intervening flaps. In such cases duodenojejunostomy is indicated. This is the operation recommended also in all cases of "essential" periduodenitis of the supramesocolic type when the disease is sufficiently disabling to warrant surgical treatment.

On former occasions it has been my privilege to call attention to the usefulness of duodenojejunostomy as a short-circuiting operation in cases of chronic duodenal obstruction near the duodenojejunal junction[10]. The operation then described consisted of an anastomosis between the jejunum and the third, or submesocolic, portion of the duodenum. This technic has proved satisfactory also in cases where periduodenal adhesions were limited to the submesocolic part of the duodenum. But this operation does not drain the duodenum satisfactorily in supramesocolic periduodenitis, which is by far the most frequent and important type. In these cases the anastomosis must be made on the second portion of the duodenum. After the duodenum has been freed from its restricting bands and membranes a jejunal loop is passed through an opening made in the transverse mesocolon exactly as in posterior gastroenterostomy, but with the additional feature that the loop is also passed through an opening made under the right border of the omentum at the duodenal margin. An anastomosis is then made between the jejunal loop and the duodenum in front of the pancreas. The opening in the mesocolon is sutured to the jejunum to prevent herniation. In some cases with freely movable duodenum, the mesocolic opening may be sutured directly to the duodenum. When that cannot be done, a short-cir-

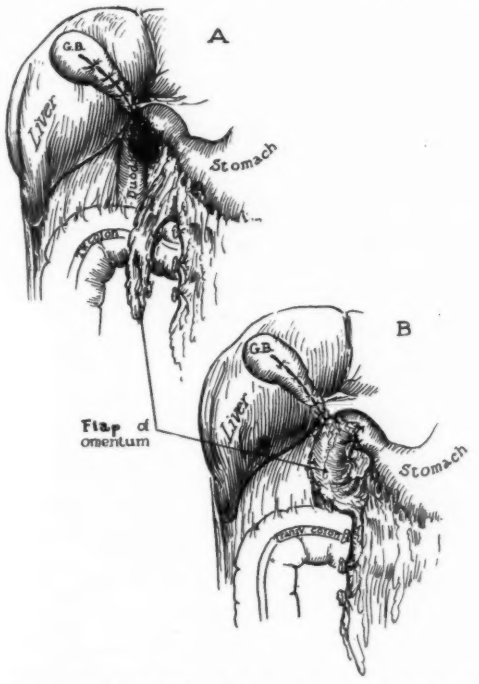


Fig. 10. A. Gallbladder freed from its periduodenal adhesions; preparation of omental flap.
B. Application of attached omental flap.

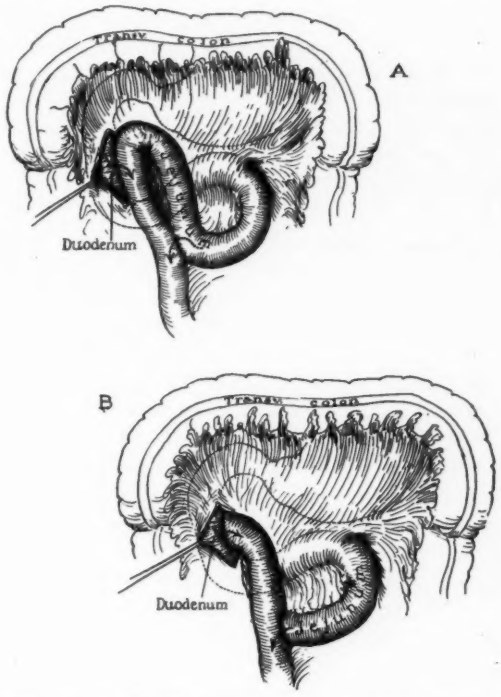


Fig. 11. A. Duval's transmesocolic duodenojejunostomy and supplementary jejunojejunostomy.
B. Same operation with Gregoire's technic.

cuiting jejunojejunostomy must be done or a jejunoduodenal vicious circle might take place (Fig. 11, A). Duval lays stress on this supplementary anastomosis in all cases of supramesocolic duodenojejunostomy, while Grégoire advises a jejunal "Y" anastomosis (Fig. 11, B). It is my opinion that Grégoire's technic is the most rational, although I have not practiced it for the reason that in my hands it cannot be done as cleanly as the other. Because of the unusual length and mobility of the duodenum in several of my cases, the supplementary jejunal operation has not always been made. The additional anastomosis is probably necessary in the majority of the cases.

Duodenojejunostomy for periduodenitis by transmesocolic methods has been made by me on ten patients—four males and six females. Their ages ran from 22 to 45 years. The outstanding symptoms in all these patients were headaches, epigastric pain after meals, nausea and bile emesis. The duration of the disease had been "from childhood" in four patients and from five to fourteen years in the other six. Medical, postural, and dietetic treatments were tried in all cases before operation was advised.

Although the time has been too short for final judgment (the first operation having been made less than two years ago), the results to date have been highly satisfactory. Some of these patients are today my most enthusiastic friends, because of their freedom from dyspepsia and pain, and their ability to eat, work, and enjoy life.

The younger patients have been relieved from their symptoms through operation much more promptly and definitely than those who were older. The epigastric pain, and also the headaches and other signs of toxemia, disappeared in practically all, but sensations of nausea and fullness after meals were not entirely removed in some of the older patients. The two oldest patients, both female, aged 41 and 45 years, had the least satisfactory results. It would seem that after the duodenum has practiced antiperistalsis for many years, it becomes increasingly difficult to stop the habit, even if there be no apparent exciting cause present. The fluoroscope has shown in such cases that the sensation of nausea and epigastric distress corresponds to the time of the duodenal antiperistaltic waves, the same as it does in patients before operation.

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## LIMITATIONS OF COD LIVER OIL IN RICKETS

Cod liver oil, long recognized as having anthrachitic potencies, has been heralded as a veritable specific, alike for the prevention and the cure of rickets. Under the unfeigned encouragement of the medical profession, child welfare agencies everywhere have preached the doctrine of the liberal administration of cod liver oil in infancy. The public has been informed through numerous channels, including even the legitimate advertising and the sales promoting of manufacturers. In consideration of the protests against the indiscriminate administration of iodine in the prophylaxis of goiter, it may be asked to what extent the promotion of the use of cod liver oil in infancy is on a basis that is defensible from every standpoint. Is it effective? Does it involve possibilities of unsuspected harm? Is it worth while? Should it be modified in any way? Evidence is already available that the highest expectations are not consistently realized. However, the unqualified success obtained with cod liver oil under carefully controlled conditions of many clinicians should give assurance of the wisdom of its inclusion in prophylaxis. What is needed above all at present, is a better understanding of how rickets may be averted in the home as well as in the well ordered clinic. (Jour. A. M. A., June 19, 1926, p. 1912).

# THE RELATION OF SUBPERITONEAL FAT TO ABDOMINAL HERNIA*

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The object of this paper is to discuss the more or less known facts concerning subperitoneal fat in its relation to abdominal and pelvic hernia, and the origin and clinical significance of fat in the inguinal canal. I wish to consider the abdomen and the pelvis as one cavity and to define all hernias in any part of the body as displacements and protrusions of a part which has escaped from its natural cavity by some aperature; and furthermore that a sac is not a necessary accompaniment. All forms of hernia are due, in order of importance, to (1) weakness of support; (2) pressure from within, and (3) traction from without. The various types of abdominal and pelvic hernias are described according to the openings through which they occur; (1) the internal inguinal ring; (2) Hesselbach's triangle; (3) femoral canal; (4) obturator foramen; (5) greater and lesser sciatic foramina; (6) pelvic floor; (7) superior and inferior lumbar triangles; (8) vascular perforations of the linea alba and linea semilunaris; (9) atrophic areas in the transversalis fascia, lateral to the linea semilunaris; (10) abdominal wounds; (11) umbilical ring, and (12) the abdomino-thoracic diaphragm. The last two, umbilical and diaphragmatic hernias, will not be considered owing to the total lack of subperitoneal fat beneath the inner rim of the umbilicus and the almost total lack of it beneath the diaphragm. I could find no reference to subperitoneal fat preceding these two types of hernias.

The first ten types of abdominal and pelvic hernias occur through openings around which there is a varying amount of subperitoneal fat, loosely attached to the overlying peritoneum and even less so to the underlying tissues. This subperitoneal fat is frequently, and perhaps normally, found projecting into and even through these openings, and no doubt, is occasionally forced or pulled considerably beyond their external boundaries. When such a condition arises the peritoneum may become evaginated and if any viscus or tissue later enters this peritoneal evagination (sac), we then have had in succession three distinct hernias; (1) a hernia, without a sac, of subperitoneal fat; (2) a hernia, of a sac only, of peritoneum, and (3) a hernia, with a sac of peritoneum, containing some abdominal or pelvic viscus.

The fleshier the individual the greater the deposit of subperitoneal fat, the greatest deposits lying along the path of the uro-genital ridge, from the kidney to the crural arch. From here the fat spreads laterally; inwardly to the deep abdominal ganglia and outwardly around to and beneath the anterior abdominal wall. There is always a significant deposit above and below the umbilicus, particularly over the falciform ligament of the liver and in the space of Retzius.

## HISTORICAL

The role of subperitoneal fat in abdominal hernia has long been known. Inguinal hernias, according to Garrison, have been operated upon since the time of Hippocrates, but the first mention of fat in the inguinal canal did not occur until the time of Ambroise Pare. From the works of Pare 1564, Morgagni 1704, and Scarpa 1809, one might safely state that our present knowledge of abdominal hernia is based, including hernia of the subperitoneal fat through the walls of the abdomen. Very little of fundamental importance has been added since, excluding the operative cure. Pare first described fatty masses in the inguinal canal and scrotum as attached to the spermatic cord and considered them as adjuncts to intestinal hernia. Morgagni in 1704 stated that Schulzius previously had described inguinal canal lipomata as being mistaken for bubonoceles, and that Petichius thought that fatty tissue in the inguinal canal and scrotum was subperitoneal fat carried out through the internal inguinal rings. Morgagni (Letter 43, art. 10 p. 557), in the first part of the 18th century, was probably the first to accurately describe epigastric hernia as a protrusion only of subperitoneal fat through the linea semilunaris and linea alba. He further stated that such hernias rarely contain a peritoneal sac without additional traction. It is interesting to note that de Garengeot in 1743 (quoting Watson) and Gunz in 1774 (quoting Wernher), stated that epigastric hernia was nothing more than a protrusion of

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the subperitoneal fat through the fused abdominal fascia on each side of the rectus muscle. De Garengeot (quoting Watson), was probably the first to associate gastro-intestinal symptoms with epigastric hernia. Pelletan (quoting Wernher) in 1780 independently described epigastric hernia as Morgagni and Gunz had previously. Through the 19th century and up to the present there have been a few reports of importance of herniated subperitoneal fat through the epigastrium, more or less accurately and inaccurately described. It is very evident from the literature that the above quoted observers have received very little attention and that the subject of subperitoneal fat in its relation to all abdominal hernia has not received its due consideration. From the attached bibliography I can recommend the works of Pare, Morgagni, Gunz, de Garengeot, Cooper and Watson. The treatise on hernia by Watson is a mine of information and I wish to acknowledge appreciation for many of my references.

## INGUINAL HERNIA

The vaginal tunic of the spermatic cord and testicle is merely a constricted portion of the peritoneum. Contrary to general opinion, it was not pulled into the scrotum by the descent of the testicle. The scrotum is merely an evaginiation of a portion of all of the layers of the lower anterior wall, including the peritoneum. Therefore, the tunic of the cord and the testicle preceded the testicle; it is nothing more than abdominal peritoneum. In the condition known as undescended testicle, we generally find the peritoneal sac extending lower than the testicle. This proves beyond all doubt that the evaginated abdominal peritoneum preceded the testicle into the scrotum. The mesothelial tunic of the testicle and of the cord, therefore, must be looked upon as nothing more than abdominal peritoneum with all its characteristics. A rare example of the tunica vaginalis resembling the abdominal peritoneum is demonstrated by a case of mine in which I found a small fatty tumor beneath the tunica vaginalis testis and above the tunica albuginea. On dissection I found this lipoma more intimately attached to the former, and it was nothing more than subperitoneal fat beneath the mesothelial coat of the testicle. The most marked characteristic of subperitoneal areolar tissue is favoring a deposition of fat within it, which is beautifully shown by the work of Gage. If this is true above the internal ring, why is it not true below it. We frequently see "subperitoneal" fat attached to the spermatic cord during operations for hernia, and if it reaches a size large enough to be called a lipoma it is incorrectly looked upon by some as a fatty hernia. Petichius in the early part of the eighteenth century advanced the theory that the fat

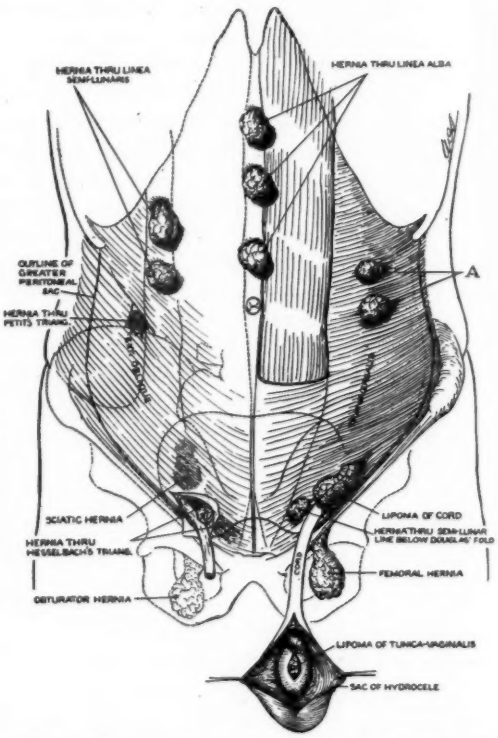


**Fig. 1. The openings in the abdominal and pelvic walls through which subperitoneal fat herniates. Note "subperitoneal" fat beneath the tunica vaginalis testis.**

covering the cord came from above the internal ring and was carried, or herniated, downward later; and this has been the prevailing view, more or less since. Scarpa, however, felt that the vaginal process of the cord, similar to the abdominal peritoneum, favored the development of fat on its external surface and that these fatty deposits along the cord were not transplanted subperitoneal fat. This idea was remarkable owing to the fact that he long ante-dated all embryologic studies. It seems logical to assume, therefore, that the inguinal subperitoneal areolar tissue as well as the abdominal favors the deposi-

tion of fat; and that fatty masses in the inguinal canal, no matter how large, should, generally, not be looked upon as fatty hernias. If these fatty masses were originally above the internal inguinal ring, and it could be proven (which is inconceivable) that they herniated through the internal ring, or any other portion of the floor of the inguinal canal, they could then properly be termed fatty hernias. In most instances, fat attached to the vaginal process of the cord, extends through the internal ring and joins the subperitoneal fat; and as frequently stated by the older writers, this continuous mass of fat, may from traction or active guiding, evaginate the peritoneum through the internal ring into which sac a viscus may be forced. This is a point most worthy of attention in order to prevent recurrences after operations for indirect inguinal hernia. In all operations for indirect inguinal hernia what fat there is along the cord should be carefully removed up to and beyond the internal ring. This will reduce the size of the cord within the repaired internal inguinal ring, resulting in a much firmer support. In numerous recurring indirect inguinal hernias I have found during the second and even the third operation that the subperitoneal fat along the cord and within the internal ring had not been previously removed. I am partial to the view that this fat may be a factor in causing recurrences. Sir Astley Cooper speaks of fat in the inguinal canal extending through the internal ring, which when absorbed during emaciation, relaxes the ring and thereby favors hernia. Pare reports a large inguinal hernia cured by a deposit of fat in the inguinal ring, correlating his clinical deductions with a necropsy. This fat after long pressure from a supporting bandage, became inflamed, and attached itself firmly to the margins of the ring. Could that not occur, under similar conditions, with the modern truss? Fat, however, within the internal ring contributes very little support to the tissues above, and it might well be looked upon at least as a potential, if not an actual, point of weakness. Small inguinal indirect hernias have been known to disappear for a time after the patient has increased in weight, due no doubt to an increased deposit of fat within and above the internal ring; but one could hardly consider this a firm support. A palpable fatty mass in the inguinal canal with or without the presence of an indirect hernia should indicate that the cord is quite likely surrounded by a thick layer of subperitoneal fat which extends through the internal ring and into the subperitoneum.

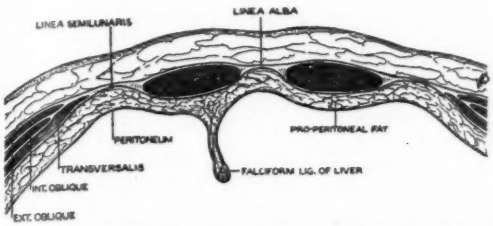


Fig. 2. The fused aponeuroses on each side of the recti muscles. Through these areas branches of the deep epigastric arteries penetrate, presenting openings through which subperitoneal fat herniates.

Saccular hernia through Hesselbach's triangle not infrequently contains a thick layer of subperitoneal fat surrounding the sac. The urinary bladder, owing to traction or guiding from a prevesical lipoma, which is subperitoneal fat, is frequently drawn through the direct inguinal hernial opening, producing a bladder hernia alone, or in addition, a peritoneal sac into which a viscus may be forced. This subperitoneal fat (prevesical lipoma) so obscures the bladder that the latter occasionally is injured during an operation.

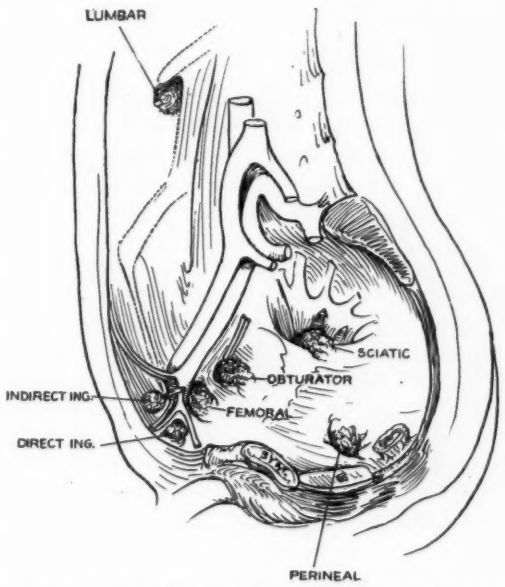


Fig. 3. The pelvic wall stripped of peritoneum showing the various openings through which subperitoneal fat herniates.

Additional evidence as to the value of the traction theory of hernia is a case of ureteral hernia through Hesselbach's triangle reported by Watson; two lipomata, no doubt of subperitoneal origin, preceded the ureter. Surely pressure alone could not have forced the ureter out of the abdominal cavity if the subperitoneal lipomata had not been present to receive the intra-abdominal pressure and to act as a tractor or a guide.

### SLIDING HERNIA OF THE SIGMOID

Subperitoneal fat, in a significant proportion of sliding hernias of the sigmoid, appears to be one of the etiological factors. It is interesting to note that Scarpa stated that oftentimes, if present, the inguinal fat, through tension, prevents the reduction of this hernia. I could find no reference to the subperitoneal fat within the inguinal canal, when connected with the subperitoneal fat attached to the extra-peritoneal surface of the sigmoid, as being a factor in producing, through traction or guiding, a sliding hernia of the sigmoid. In three of my own cases of sliding hernias of the sigmoid, I found a taut band of fat, naturally in areolar tissue, extending from the lower part of the inguinal canal up to and firmly attached to the non-peritoneal surface of the sigmoid, which prevented reduction into the abdomen. I feel that this fat, because it was taut, had gradually pulled the non-peritoneal surface of these sigmoids around and through the internal ring. If it did not pull them through, it certainly formed a guiding path. As Poynter states, a predisposition to sliding hernia of the sigmoid is its congenitally low lying position, with its non-peritoneal surface close to the internal ring. A direct band of fat attached below cannot help but act as a tractor or guide. In operating upon these hernias all fat should be stripped from the upper cord, internal ring, and extra-peritoneal surface of the bowel.

### FEMORAL HERNIA

The sacs of femoral hernias are nearly always covered by a thick layer of fat, and rarely does one find a sac without abnormal traction on the part of the surgeon. The subperitoneal fat produced the tumor or so called femoral hernia, and if a peritoneal sac is present, without traction by the surgeon upon the femoral lipoma, it is generally of negative significance and rarely contains intestine. In the majority of instances when intestine does pass through the femoral canal it becomes strangulated, or irreducable. Most so called femoral hernias, therefore, are nothing more than herniated subperitoneal fat. Poynter states that in the dissecting room, the femoral canal frequently and normally contains subperitoneal fat, which might be looked upon as a predisposition to femoral hernia. The characteristic thrill produced over a femoral hernia, in coughing, is generally due to the transmission of a wave through subperitoneal fat, which of

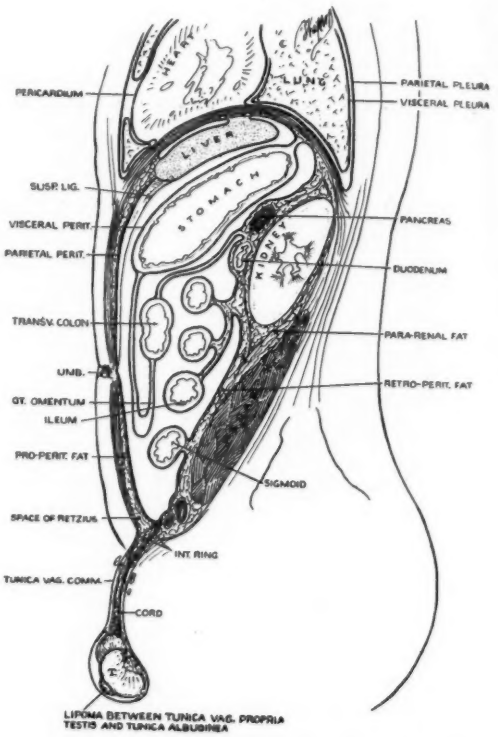


Fig. 4. Cross section of the peritoneum through the mid portion of the psoas muscle. Note the deposit of subperitoneal fat extending into the scrotal peritoneum.

course is directly connected with the fat over the femoral hernia. Removing the fat, thereby obliterating traction, as a rule cures the so called femoral hernia, which rarely is accompanied by an evaginated peritoneum or sac.

### OBTURATOR HERNIA

Obturator hernias are rare and as Watson states are sometimes due to traction from subperitoneal fat. Gerdes (quoting Watson) found a large lipoma preceding an obturator hernial

sac. Deep lipomata presenting in the upper portion of Scarpa's triangle may be attached to or originate from the subperitoneal fat passing through the obturator canal.

### SCIATIC HERNIA

The extremely rare hernias through the greater and lesser sacro-sciatic foramina known as

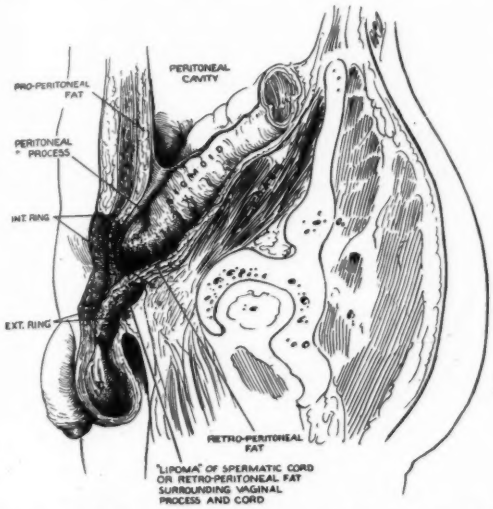


Fig. 5. Cross section of the peritoneum through the internal inguinal ring. Note the subperitoneal fat beneath the sliding hernia of sigmoid, extending downward into the scrotum.

sciatic and ischiatic hernias, may be preceded by descent through these openings of subperitoneal fat. The deep lipomata of the buttox, so difficult to remove completely and not infrequently recurring, may be nothing more than hypertrophy of subperitoneal fat extending through the sciatic foramina into the deep tissues of the buttox.

### PERINEAL HERNIA

Perineal hernias have been found to be preceded by a lipoma, quite likely of subperitoneal origin. These hernias descend between the vagina and rectum in females and the bladder and rectum in males. Occasionally they descend through an opening in the levator ani (Watson).

### LUMBAR HERNIA

Herniation of subperitoneal fat through the superior and inferior (Petit's Hernia) lumbar triangles has been observed. Watson quotes Morestin who states that fatty hernias occur through slit-like openings in the lumbar fascia. He also states that Hutchinson, Lejars, Demoulin and Turner have reported cases of fatty lumbar hernias in which no sac existed. Such hernias he feels are projections, through the supporting structures of the lumbar region, of subperitoneal lipomata.

### LATERAL ABDOMINAL HERNIA

I have never seen a hernia of subperitoneal fat through the transversalis fascia external to the linea semilunaris. Dr. C. W. M. Poynter has found them repeatedly in the dissecting room and feels that they are due to atrophic or congenitally weakened spots in the transversalis fascia. One naturally wonders if lateral abdominal pain may be due occasionally to this type of hernia, particularly if a nerve trunk has been impinged.

### EPIGASTRIC HERNIA

The so called epigastric hernias are, as Morgagni in the early eighteenth century stated, protrusions of subperitoneal fat through the vascular openings in the linea alba and linea semilunaris. A similar type of hernia occurs, but less frequently, below the umbilicus. As Scarpa stated, traction by the surgeon may evert the peritoneum, thereby producing a sac, which did not exist before. These original observers felt that gastro-intestinal symptoms were occasionally produced by these fatty hernias in the epigastric region. They are, however, generally of

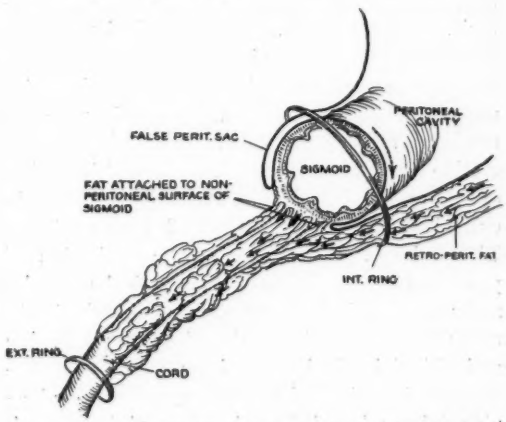


Fig. 6. The nonperitoneal surface of the sigmoid being pulled or guided through the internal ring by the subperitoneal fat of the spermatic cord.

negative significance and should be ignored unless they become tender from strangulation. Brown in several instances found the accompanying artery thrombosed, which he feels may be the cause of reflex gastro-intestinal symptoms. In the majority of instances, when troublesome

gastro-intestinal symptoms accompany epigastric hernia, no relief of the gastro-intestinal symptoms is obtained from the herniotomy. My small number of operations for eradicating epigastric hernias, whether or not they were inflamed or tender, gave no relief and were followed by secondary intra-abdominal operations for the primary complaint. Intra-abdominal pressure is the main cause of these hernias; Hardie reporting two cases in which epigastric hernias immediately followed external force to the abdomen.

### ABDOMINAL WOUND HERNIA

Post-operative hernia may be caused by protrusions of subperitoneal fat through the stitched edges of the abdominal muscles and aponeurosis. The transversalis fascia as a rule cannot be stitched separately and accurately enough to withhold the fat from projecting, in areas, toward the surface of the wound. I have had two post-operative hernias, from my own work, occurring in fleshy individuals within 10 days following a celiotomy. In each instance an immediate repair of the wound was necessary, at which time the principal part of the post-operative hernias was subperitoneal fat which had forced itself through the previously stitched recti muscles and aponeurosis. I am inclined to feel that this fat was the primary factor. There is a possibility of numerous post-operative hernias being started in this way and not discovered until long after the operation. During the dissection of old post-operative hernias, not due to infections, I have frequently noticed a firm union between the subcuticular and the subperitoneal layers of fat. This quite likely was due to the projection of portions of subperitoneal fat through the muscles and aponeurosis before they became united. In many instances while cutting through weak, thin and old abdominal scars from previous operations, and not looked upon as post-operative hernias, I have found the subperitoneal fat extending through openings 1 to 2 centimeters in diameter in the abdominal aponeurosis, and united with the subcuticular fat, the edges of the rectus muscle being completely separated. As one of the etiological factors in post-operative hernias, the protrusion of subperitoneal fat through the abdominal muscles and aponeurosis may be safely given more consideration.

### SUMMARY

Subperitoneal fat which is embedded in areolar tissue, is loosely attached to its limiting walls, the peritoneum and the structures external; and it can easily pass through the various openings leading from the abdominal and pelvic cavities. The constant, and frequently marked, intra-abdominal pressure is perhaps the most frequent etiological factor. In the deposition of this fat, the various canals and openings from the abdominal and pelvic cavities may become filled with it and deposits may even take place beyond their outer borders. In either event, whether forced through or simply thereby deposited, it becomes more or less attached to structures outside of the abdominal and pelvic cavities; and if traction upon this fat occurs it may pull additional fat through. If the fat becomes neoplastic or hyperplastic, the outside structures have additional tissue to which they can become attached, thereby increasing traction. Later peritoneal sacculation may occur into which abdominal and pelvic viscera may be forced. The opposite view in many instances may be taken, that subperitoneal fat, filling the various openings leading from the abdominal and pelvic cavities, prevents intra-abdominal pressure from evaginating the peritoneum, thereby preventing hernia.

Fatty masses in the inguinal canal should be looked upon as merely subperitoneal fat laid down normally on the outer surface of the scrotal peritoneum (vaginal processes of the spermatic cord and of the testicle). This fat practically always extends upward and through the internal

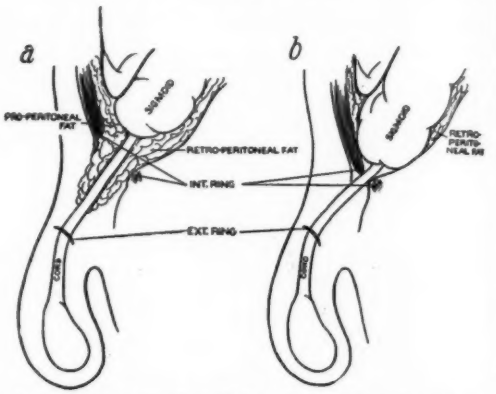


Fig. 7. The subperitoneal fat of the spermatic cord and around the nonperitoneal surface of the sigmoid, removed, and the internal ring closed.

inguinal ring to join the abdominal subperitoneal fat. Perhaps the percentage of our operative cures for indirect inguinal hernia might be increased if all of this fat along the spermatic cord and within the grasp of the internal ring is carefully and thoroughly removed in order to allow a better closure of the internal ring. The role of subperitoneal fat in sliding hernias of the sigmoid deserves some attention; and furthermore, subperitoneal fat as one of the primary factors in early and late post-operative hernias is a possibility.

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# UNILATERAL FUSED KIDNEY*

## Report of a Case

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*St. Paul, Minnesota*

Unilateral fusion is the union of both kidneys on one side of the body. It is an anomaly of form of the kidney and is result of fusion of the lower pole of the higher lying kidney with the upper pole of the lower organ. Both kidneys usually come to lie on the side of the body occupied by the upper organ. However, Dickenson, 1895, and Kidd, 1910, each reported a case in which the upper organ was the ectopic one. In either case, the ureter of the malposed kidney crosses midline to enter the bladder normally.

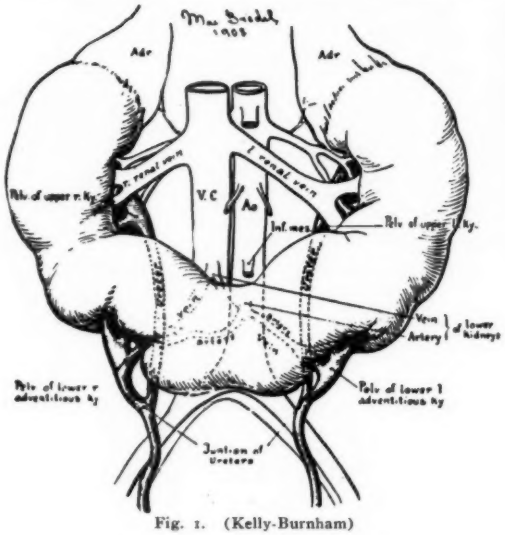


Fig. 1. (Kelly-Burnham)

Unilateral fused kidney is the rarest of all renal anomalies. A survey of the literature would indicate that diagnosis of this condition in the living subject has been accomplished by combined cystoscopy and pyelography but twelve times. Steward and Lodge found but one case in 6500 autopsies, and Morris, one in 15,908 post mortem examinations. A small number have been discovered during operations conducted upon the kidney, while others have been encountered in the course of surgical procedures on abdominal viscera.

Fusion of the kidney occurs during early embryonic life. On each side of the body a ureteral

*Presented before the Twin City Urologic Society, St. Paul, Minn., September, 1925.

bud develops from the Wolffian duct and together with its metanephric blastema begins to ascend out of the pelvis toward its future position in the renal fossa. It is during ascent that fusion probably occurs by a union of the metanephric substance of one kidney with that of its fellow on the opposite side of the body. If fusion takes place between the lower poles, or between the upper poles, horse-shoe kidney results (Fig. 1). When the growth of the renal bud is more rapid on one side of the body, union results in a fusion of the lower pole of the higher lying kidney with the upper pole of the lower (Fig. 2).

The clinical picture may offer no suggestion that an anomalous condition exists. A palpable

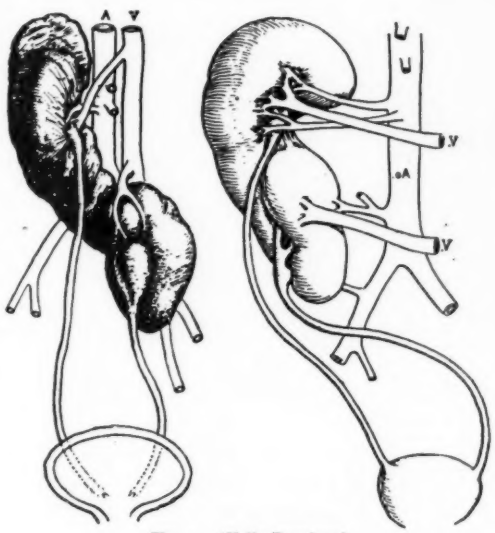


Fig. 2. (Kelly-Burnham)

abdominal tumor is present and vague discomfort in the abdomen is complained of. If calculus exists in the ectopic kidney the radiogram will generally show a shadow situated well toward the mid line in the lower abdomen. Enlargement of the mass accompanied by increased pain would indicate the presence of hydronephrosis. Urinary symptoms are usually absent.

CASE REPORT

A Russian male, only slightly able to understand or converse in English, thirty-nine years of age, consulted the medical department of the Wilder Dispensary because of tumor in his abdomen. He first noticed the mass seven years ago, and believed it was becoming larger. He also complained of vague abdominal pains occasionally accompanied by nausea.

On physical examination a mass about the size of an orange could be palpated just to the left and slightly below the umbilicus. It was smooth, firm, and only slightly movable. A linear scar corresponding to a left rectus incision was visible on the upper abdomen. It was gathered that he had been operated on because of

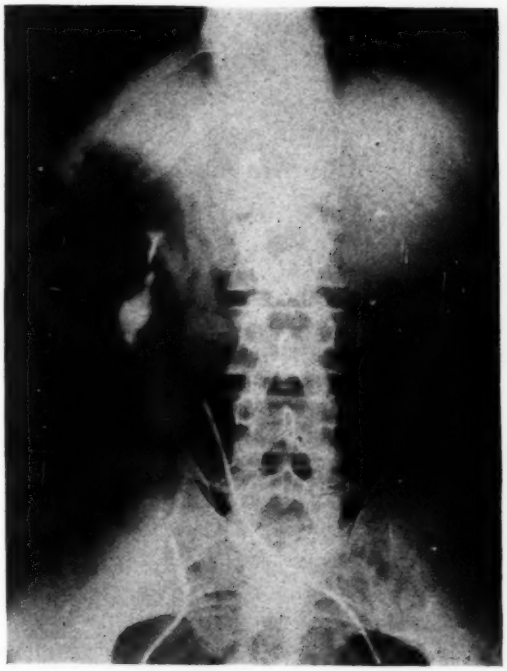

Fig. 3.

this mass seven years ago. Fluoroscopic examination of the gastro-intestinal tract revealed a normal stomach, duodenum, and colon. The report stated that the abdominal mass was apparently near the lower border of the stomach but was not connected with it. The case was referred to the Genito-Urinary Clinic. Cystoscopy and pyelography were performed in an effort to establish the nature of the mass.

*Cystoscopy*:—July 14, 1925. Bladder urine clear and negative to microscopic examination. Bladder mucosa normal throughout. A few small polypi were seen in the prostatic urethra to either side of the verumontanum. Ureteral orifices were symmetrically situated and emitted good jets of clear urine. A number 6 F ureteral catheter was passed full length on each side and specimens were collected. Sodium Iodide, 15 per cent, was injected into left kidney pelvis and along left ureter while slowly withdrawing the catheter.

*Laboratory Examination*:—Right ureteral specimen: 6 pus per high power field centrifuged. Left ureteral specimen: 4 pus per high power field centrifuged.

*Interpretation of Pyelogram*:—The left kidney was poorly rotated with the ureter entering anteriorly and

the calyces directed posteriorly. The lower end of the kidney was level with the third lumbar vertebra (Fig. 3). A lead catheter in the right ureter crossed mid-line until its tip lay slightly to the left of articulation of the third and fourth lumbar vertebrae: It was then apparent that one of the fusion anomalies of the kidney was present.

*Cystoscopy*:—July 21, 1925. A second cystoscopy was performed and the pelvis and ureter of the right kidney injected after wedging a catheter with a number 15 F wax bulb into the lower ureter. Injection with Sodium Iodide, 15 per cent, was carried out and a good outline of the entire ureter as well as of the pelvis obtained.

Fig. 4.

*Interpretation of Pyelogram*:—A small kidney pelvis was situated to the left of mid-line lying transversely with the larger of the two major calyces to the left of the fourth lumbar vertebra. A small major calyx with a long narrow infundibulum was situated toward the right over the body of the fourth lumbar vertebra. The ureter joined the pelvis inferiorly and passed down across mid-line to enter the bladder in a normal position (Fig. 4).

Fusion had occurred between the lower pole of the left kidney and the upper pole of the right. Because of this fusion the left kidney was poorly rotated while the right lay transversely with the greater part of its substance to the left of the mid-line, connected by a narrow strip to a smaller prevertebral portion (Fig. 5).

Both kidneys were the seat of mild pyelonephritis, as made evident by the finding of pus cells in the specimens. No other pathology could be demonstrated. The patient was given instructions to combat the infection, and discharged.

When the nature of an abdominal mass cannot be determined by the ordinary means, complete urologic investigation should be carried out. Abnormalities of the kidney will be found to account for many of these masses. Accurate diagnosis of co-existing renal disease can be made and proper treatment instituted.

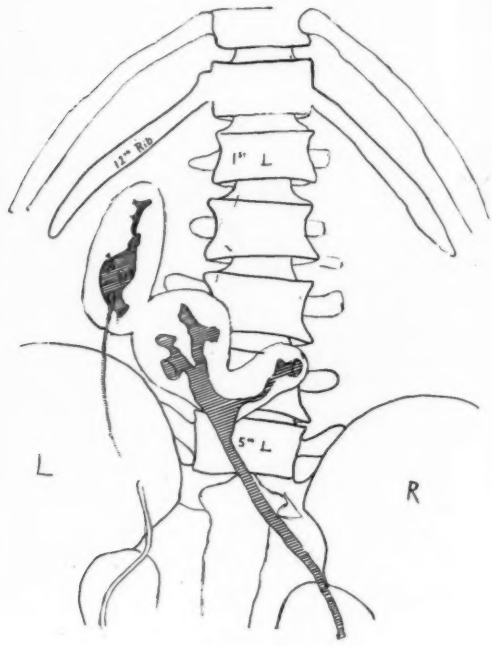


Fig. 5.

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# DIAGONAL END-TO-SIDE INTESTINAL ANASTOMOSIS*

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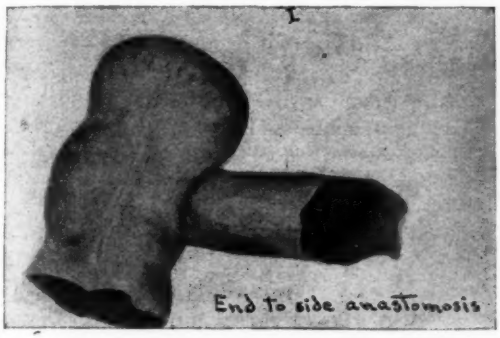
Since the days of Roger of Palermo who in about 1130, seems to have made the first record of intestinal suture, there have occurred many advances in surgery of the gastro-intestinal tract. According to Garrison, the text book written by Roger was the standard at Salerno, where he (Roger) had been a student and a teacher. In this text he introduced suture of the intestines over a hollow tube.

There have been many additions and refinements introduced since from time to time, but we are perhaps more familiar with those of a later day described and practiced by Theodor Billroth,

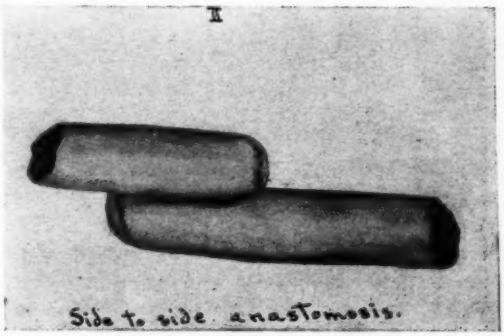



Mikulicz, Keen, Senn and Murphy. The work of these immortals is being carried forward today by the Mayos and many of their contemporaries so that gastro-intestinal surgery with the aid of advancing knowledge of physiology and chemistry is approaching more nearly the goal of therapeutic accuracy.

For some years the method of intestinal anastomosis, after resection of the intestinal segment, has been either that of side to side (Fig. 2) or of end-to-side (Fig. 1) anastomosis. I refer particularly to those instances where the small gut is joined to the colon. The end-to-end anastomosis seldom is applied here.

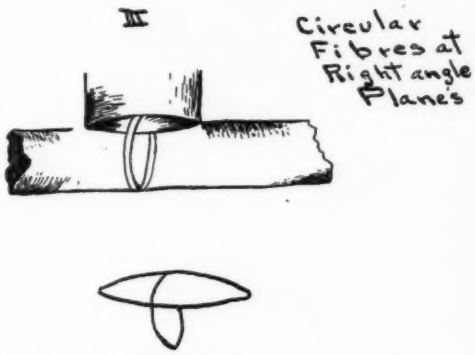
The end-to-side anastomosis is unanatomical (Fig. 3). If we stop to consider for a moment the histologic anatomy of the musculature of the intestinal walls we find that we are approximating the circular fibres of the small gut at right angles to those of the large gut. The tendency, therefore, is toward stenosis at the point of anastomosis.

The side-to-side anastomosis, which is perhaps more commonly used, also has its disadvantages




(Fig. 2). The current passing through the lumen of such an anastomosis must be deflected twice in its course and each time approximately at right angles. The tendency, therefore, during peristalsis is toward an impact against the blunt end or stump and a dilatation of the gut at this point (Fig. 4). This gives the clinical symptom of pain, tenderness and local stasis.

Some years ago I had occasion to resect part of the colon and to do a side-to-side anastomosis-ileum to the side of the colon. The patient was comfortable for a few months after which the symptoms I have mentioned developed and the

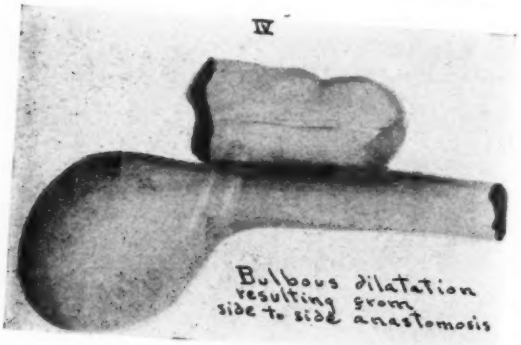


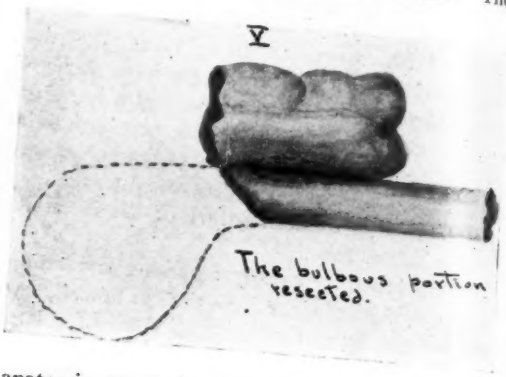

barium x-ray showed a ballooning at the resected end of the small gut at or just beyond the point of anastomosis. On reoperation (Fig. 5), the distended stump was found and resected and the

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May 18, 1926.

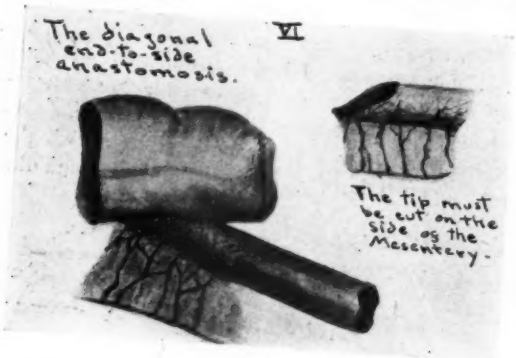
operation was followed by relief of the symptoms.

This experience suggested a course which would eliminate the possibility of such a malfunction and which would at the same time give a larger stoma than the one which results from end-to-side anastomosis. Moreover the element of postoperative stenosis at the point of the junction could be eliminated.

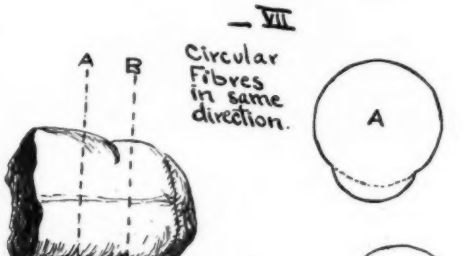



This simple procedure consists of cutting the small gut diagonally (Fig. 6), swinging the enterostomy clamp higher on the side opposite the mesentery in order that the mesentery will amply nourish the tip of the resected intestine. This gives a larger opening in the small gut for approximation to one of the same size in the large gut. It throws the current in the lumen of the small gut directly into the lumen of the large gut and eliminates the two right angles which are present in the side-to-side anastomosis. One or two stay sutures are placed in the acute angle to fasten the two viscera securely and to prevent tension at this point of the anastomosis. The anatomic approximation of the musculature is thus more accurate. The circular fibres of the two viscera are in this manner more or less continuous (Fig. 7) instead of at right angles to each other, and any possible bulging or dilatation of a stump is impossible.




This procedure, done on the experimental animal, has worked perfectly and the specimen removed after a period of several weeks showed the lumen functioning almost in a straight line and with no dilatation whatever.



# PERICARDITIS*

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Of all the cardiopathies, few escape detection more easily than does pericarditis, particularly in its earlier stages. The quite obvious reason for this rests in the so frequent absence of subjective symptoms, or their being masked by the more conspicuous symptoms of concomitant disease. First recognized in the cadaver in the Eighteenth century as a hydrops of the pericardium, pericarditis was thought to be always characterized by the presence of fluid. With this conception in mind, Senac during the middle of the Eighteenth century described the symptoms of the disease as being pain and pressure in the anterior part of the chest. Some time later, Auenbrugger added precordial bulging and increase in the area of cardiac dullness to the list of manifestations brought on by pericarditis. Collin, in 1824 described "the sound of new leather" whose presence he considered diagnostic of pericarditis prior to the state of effusion. His discovery, however, was given little note and even less credence until the year 1836 when Bouillaud stressed the value of friction sounds and particularly the new leather sound as being important in the diagnosis of pericarditis.

Sibson[1] very rightly made the following statement, "Inflammation of the surface of the heart and the lining of the pericardial sac occurs so very rarely by itself that we cannot practically regard it as a distinct disease." While it is possible for a primary idiopathic pericarditis to exist, the frequency of this diagnosis continues to become less and less with more careful examination for obscure focal infections such as infected teeth, pyorrhea, infected tonsils, chronic gallbladder disease, tracheo-bronchial lymphadenitis or even a pulmonary infection without clinical manifestations.

Secondary pericarditis, either hematogenic or as result of contiguity is more frequent. In this group, rheumatism, pneumonia, general sepsis, pleurisy, empyema, tuberculosis, nephritis, diabetes, carcinoma, typhoid fever and diphtheria rank as paramount among the primary diseases to which a concomitant or subsequent pericarditis with or without effusion may be secondary.

Because of the broad extent of the field of discussion and the time limitations of this paper, two phases, only, of pericarditis will be considered: (1) traumatic pericarditis and (2) adherent pericardium. The former is selected because of its infrequency; the latter because of its frequency.

## TRAUMATIC PERICARDITIS

Traumatic pericarditis owing to its infrequency receives but little mention in the literature. Many authors fail to mention it at all. Tice[2] alludes to the possibility of its existence in a single sentence. Vaquez[3] in his recent new work disposes of the subject in fifty words. "Traumatic pericarditis, which was described long ago in France as well as abroad, ordinarily assumes the dry form. Its existence has been proved by necropsy on many occasions. Its symptomatology lacks clearness and presents nothing special. It may recover or be the point of departure of adherent pericardium."

From this brief description it may be readily inferred that the condition is more or less of a clinical curiosity. One such case was seen in our clinic during the past year.

A. M., male, white, aged 27, was admitted to the hospital in a state of unconsciousness following an automobile accident in which he had been thrown violently forward and against the steering wheel of the car which he was driving. Examination on admission showed no abnormal findings other than a beginning discoloration of the right eye, excoriation of the nose and a bruise of the left leg. Temperature 98.2°. Pulse rate 76 per minute. Respirations 20 per minute. Leucocyte count 9000. On regaining consciousness he complained of pain in the upper abdomen and the left chest, cough and chills. Thoracic pain was aggravated by deep inspiration. He felt most comfortable in the semi sitting position. He stated that he had felt perfectly well up to the time of his accident.

On the following day the temperature was elevated to 101°, the pulse to 110, and the respirations to 35 per minute. There was present at this time a definite friction rub along the left border of the sternum. Three days after admission, there were present definite signs of left pleural and pericardial effusion and coarse rales throughout the right lung. X-ray studies at this time and subsequently showed massive left pleural effusion with slight cardiac displacement to the right and a large pericardial effusion. Hiccoughs became a persistent and distressing symptom. During the ensuing three weeks the temperature, pulse and respirations remained higher than normal. By the end of the fourth week all symptoms had subsided. The effusions were all re-

*Read before the annual meeting of the Minnesota State Medical Association, Saint Paul, May 17 to 19, 1926.

sorbed and the patient was allowed to return home feeling quite well. He has subsequently been in good health and is doing his former work as chauffeur.

### ADHERENT PERICARDIUM

Adherent pericardium, the all important sequela of pericarditis, presents such a variety of subjective and objective symptomatology that no single symptom complex can be considered as representative. By far the greater number of cases of this condition are secondary to a previous pericardial disease, especially pericarditis. Rheumatism, Bright's disease, tuberculosis and pleuro-pneumonia, by reason of their prominence as etiological factors in the production of this latter disease, thus also are of primary importance in the etiology of adherent pericardium. In some instances adherent pericarditis is secondary to mediastinal disease such as mediastinitis, aneurysm or malignancy. The preponderance of cases occurs between the ages of ten and thirty years.

From the standpoint of subjective complaints, adherent pericardium may be divided quite naturally into three groups as described by Frederick Tice[2].

The first is the silent group representing nearly all cases in which the adhesions are entirely intrapericardial; that is to say adhesions exist between the layers of the pericardium but not to surrounding structures. Such a condition is relatively benign and usually remains unrecognized during life; for while these adhesions may limit the lubrication of the heart, rarely, if ever, do they embarrass the functional efficiency of that organ.

The commoner manifestations of extrapericardial adhesive pericarditis are those of chronic heart disease. Dyspnea, cough, palpitation and minor states of cardiac failures are the most frequent. At times precordial pain or discomfort are complained of, probably due to a subacute inflammatory process in the pericardial sac, the pleura or the mediastinum. Painful attacks, almost anginal in character, are said to occur. At times, also, the outstanding complaints will be those of digestive disorders attendant upon cardiac insufficiency and passive congestion of the liver.

Pick's syndrome comprises the third group, which in addition to the manifestations of chronic heart disease are to be found recurrent ascites, but no edema of the legs, and the enlarged, firm liver of pericardial pseudocirrhosis causing a feeling of abdominal fullness.

Since there is such an inconsistency in subjective symptoms, the diagnosis of pericarditis must rest upon physical signs. When there are only intrapericardial adhesions present there are usually no physical signs. The following summary of important signs concerns itself only with those cases in which extrapericardial adhesions are present.

Systolic retraction, confined either to the apex or seen as high as the third space, is of importance. It is always pathological if it persists in all positions of the patient, especially in the left lateral decubitus.

Permanent retraction of the precordium when not explained by rickets, pleural adhesions, etc., is strongly suggestive of adherent pericardium.

Broadbent's sign when present is of great significance. It is not however pathognomonic, for Vaquez[3] reports this sign present in large cardiac dilatation and posterior pleural adhesions.

Wenckebach's sign, a crossed respiratory profile, is rare.

Palpation may disclose a diastolic rebound at the apex. If present it is probably always pathognomonic.

Percussion usually discloses an enlarged area of cardiac dullness, due to associated cardiac change. Of far greater importance is the absence of respiratory excursion along the borders of the area of heart dullness. The borders, being fixed, do not move with respiration or change of position.

Auscultatory findings are usually confined to those of associated endocarditis or myocarditis.

The pulsus paradoxus of Kussmaul, when unexplained by other conditions such as massive pleural effusions, speaks strongly for adherent pericardium.

Kussmaul's sign, an inspiratory swelling of the jugular veins at the height of inspiration though infrequent, is very valuable. Friedreich's sign, a diastolic collapse of the cervical veins, is also most valuable.

Fluoroscopy furnishes extremely valuable data and should be performed wherever possible. Roentgenographic plates are of less value unless multiple exposures are made with the patient in different positions. In routine fluoroscopic examination for evidence of adherent pericardium,

in addition to revealing the condition of the lungs and pleura and the general appearance, size and contour of the heart, should especially stress the mobility of the apex in different positions of the body and in various phases of respiration. A fixation of the apex shadow and absence of its lateral displacement presumes adhesions.

To establish the diagnosis of adherent pericardium, no single sign is adequate. Rather does it require a complete symptom complex. Failure to establish the diagnosis rests not so much upon misinterpretation of signs as upon errors of omission in the history or the physical examination.

Differential diagnosis concerns itself chiefly with the endocardial, valvular and myocardial states.

As to prognosis, the outlook in any individual case is determined by the extent of adhesions either already present or in the process of formation. The intrapericardial type of adhesions do not influence the prognosis. In the presence of extrapericardial adhesions, prognosis is determined by the functional efficiency of the heart to withstand the mechanical obstructions presented. The ultimate prognosis is of course bad.

The entire pharmacopeia contains no drugs that meet the therapeutic indications, which are to prevent the formation of further adhesions and combat the effects of those already established. A carefully regulated schedule of exercise combined with a proper, easily digested diet and good elimination are of great importance. Systematic graduated exercise may suffice to develop and maintain an adequate compensatory cardiac hypertrophy.

In the presence of a failing myocardium, of course, the usual routine for decompensation must be strictly observed.

Since adhesive pericarditis produces death through mechanical interference with the heart, surgery has attempted to meet the therapeutic indications which medicine cannot fulfill. Cardiolysis, Brauer's operation, is the one of choice. It has as its object the freeing of one or more of the fixed points of the heart, thus permitting greater freedom of motion to that organ. The operation is indicated when there is severe and increasing cardiac embarrassment but with the functional cardiac integrity still retained. One such operation has been successfully performed in our clinic.

CASE REPORT

The patient, M. P., a white female, aged 17, was first admitted to the hospital for a pneumonia and subsequent pericarditis. She was discharged from hospital about five weeks later feeling well. Three months from date of discharge she was readmitted complaining of cough, dyspnea, orthopnea, weakness, loss of weight, tachycardia and palpitation, occasional nausea and feeling of fullness in the abdomen. Present complaints were of about two months duration and had at first been mild but were becoming progressively worse. She was found to be in a state of marked cardiac embarrassment with a large pleural effusion on the left, cough, fever, ascites and liver enlarged about four fingers breadth below the costal margin. A diagnosis of adherent pericardium and pericardial pseudocirrhosis of the liver was made. The patient failed to respond to the usual treatment for a failing myocardium including frequent thoracentesis, so that after three weeks cardiolysis was decided upon and the Brauer operation performed under general anesthesia. After some two and one half months of convalescence the patient was sent home feeling much improved. When seen one year later she had gained twenty five pounds in weight, was feeling well, and was able to work daily at home. The liver edge had receded to its normal level. There was no fluid demonstrable in the chest or abdomen. Pulse of good quality and rhythm; rate 76 per minute. She subsequently developed a left apical pulmonary tuberculosis but is still alive, almost five years having intervened since operation. There had been no recurrence of her former symptoms.

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## VITAMIN B AND "VITALITY"

During the excessive enthusiasm a few years ago for the then newly discovered vitamins and the exalted hope of great physiologic accomplishment through their administration in a therapeutic or prophylactic way, these food factors—notably the vitamin B of yeast—were often expected to "pep up" the jaded person. Somehow it was assumed that the vitamin must "stimulate" one function or another. The actual investigations have, however, been disappointing in some ways. Secretion has not as yet been discovered to be stimulated or "pepped up" in any way. It has been demonstrated that deprivation of vitamin B does not of itself lower the basal metabolism, nor is the latter altered by large doses of vitamin-bearing products. So far as the basal heat production is a measure of "vitality," it has been shown that the ingestion of amounts of vitamin B in large excess over the minimum requirements for growth and continued well being does not benefit an animal.

# AMNESIA, A CLINICAL STUDY*

## Report of Eight Cases

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*St. Paul*

The study of cases of amnesia is a most interesting one. Since the World War this condition apparently has increased, not only in frequency but also in popularity, both in the medical journals and in the daily press. The undue publicity given these cases undoubtedly has produced a small number of amnesic malingerers who attempt to hide behind some obscure pathologic process or to seek protection under the comforting wing of some dramatic neurological disorder. The majority of cases, however, have a definite disturbance in their memory sphere based either on a functional or an organic foundation.

Memory consists in the conservation and storing up of impressions or experiences and in their later reproduction. These are the physiological elements. In addition to them are the psychological elements, important but not essential, namely, recognition and localization in the past. These memory impressions are stored up in the cerebrum, either somewhere in the frontal lobes or in a diffuse manner throughout the brain cells and correlated by way of the association fibers.

An impairment in the functions of the brain, either due to injury, disease, or psychic turmoil, frequently produces a destruction or a dissociation of memory. Circumscribed memory gaps are designated as amnesias; the circumscription may be confined to content or to time. The more recent memory groups are more readily involved in amnesia than those which are more highly organized because they are less firmly fixed and have had less opportunity for repeated impressions. The amnesia frequently involves a period prior to the injury or disease and is then spoken of as retrograde amnesia. This form often manifests itself after cerebral concussion, due to head trauma, or after marked cerebral congestion or anemia, such as occurs in attempts at hanging. Anterograde amnesia occurs much less frequently. It usually presents itself in cases where there is a gradual transition to lucidity and where the mental confusion is more pronounced than appears on the surface. This period of amnesia may exist for hours, days, or even months. In one of our cases it continued for at least three months, during which time the patient appeared normal in every way except for an occasional brief attack of confusion, associated with terrifying hallucinations.

Prolonged intoxication of the central nervous system, particularly due to alcohol, occasionally produces a mental disorder known as Korsakoff's psychosis in which amnesia is a characteristic symptom. These patients have complete loss of memory for recent events and fabricate delusions to fill in this memory gap. Associated with this they frequently suffer from multiple neuritis, with a resultant paralysis of the extremities. This characteristic picture of a Korsakoff's psychosis has been modified somewhat since the Volstead Act became effective and since the introduction of more highly toxic alcoholic beverages, such as moonshine. The amnesia is usually more prolonged and more complete. Hallucinations of sight frequently are so pronounced that the extent of the amnesia is not appreciated until the patient has practically recovered. The multiple neuritis manifests itself more in the sensory than the motor sphere, and these patients complain bitterly of excruciating pains and hyperesthesias in the extremities, while the motor control is quite normal.

Similar to alcohol, the acute as well as the chronic poisoning with carbon monoxide occasionally is followed by a period of amnesia, usually of the retrograde type. This, along with the other symptoms, is due to the characteristic pathologic changes which occur in the brain. Areas of cerebral softening secondary to emboli of or punctate hemorrhages from the cerebral blood vessels usually in relation to the lenticular nuclei are the most constant lesions.

Cases of uremia and of puerperal eclampsia may also manifest periods of retrograde amnesia during the course of their illness. This is due either to the convulsive seizures similar to what occur in epilepsy, to the general toxemia, or to the associated cerebral edema. Heilbrönner[1] reports a case of puerperal eclampsia in which the outstanding symptom was a marked amnesia, almost of the dual personality type, along with other indefinite psychotic manifestations.

*Read at the annual meeting of the Minnesota State Medical Association, St. Paul, May, 1926.

Another interesting group of amnesia cases are the epileptics. The majority of these patients present some disturbance in the memory sphere. Hand in hand with the mental deterioration which occurs so frequently in the epileptic patient, definite evidences of memory impairment manifest themselves in the daily routine of life. A true amnesia, both retrograde and anterograde in type, occurs occasionally with an epileptic seizure. The more unusual group, however, are those cases in whom the epileptic equivalent manifests itself in prolonged periods of amnesia or in twilight states. In this condition the patient may appear normal during the entire attack, wander away, and so forth, and suddenly regain consciousness without any recollection of what has transpired during the amnesic period.

Heilbrönner[1], and others, believe that these twilight and dual personality states, even when they occur in an epileptic, should be attributed to hysteria. In the hysterical amnesias the essential factor frequently is the exclusion of an unpleasant recollection or experience from the realm of consciousness. The individual, so to speak, hypnotizes himself and thus seeks refuge and comfort in the dissociation of his consciousness. He literally runs away from himself and from an intolerable problem which has become unbearable. Case 8 beautifully illustrates this in his several attacks of amnesia, which were always preceded by a disgraceful, distasteful, or discouraging situation which the patient felt unable or unwilling to cope with.

Attacks of amnesia, usually of short duration, may occur in psychopathic or insane patients during the course of a marked psychic upset. Furthermore, it is frequently impossible to later on recall the events during a severe temper spell. Similarly, individuals in a highly upset emotional state, such as caused by a serious accident, without physical injury to the patient, or during the commitment of a crime or murder, often, and truthfully, are unable to give an account of what occurred during that period.

Bleuler[2] states that in all these conditions that lead to amnesia we regularly have a markedly changed mental activity. In the hysterical states, and in attacks of rage and anxiety, it is the emotional effect that produces a different relation; in alcoholic intoxication and in epileptics it is the poisoning of the brain; while in organic cases it is, doubtless, chiefly a metabolic disturbance in consequence of circulatory changes, particularly through the vascular occlusions and cerebral pressure.

Coriat[3] groups his amnesias according to the extent of restoration of the amnesic period to the conscious self. This restoration is accomplished by what is known as tapping the subconscious, as in hypnosis, in states of abstraction, in crystal gazing, or automatic writing. Mental synthesis is the term designated when these split-off experiences are made whole again. His three groups are as follows:

1. Amnesic states in which the dissociation was of such a nature that a complete experimental synthesis of the lost experiences was possible. This group comprises short hysterical, epileptic, and alcoholic amnesias, wandering states, and certain types of amnesia following cerebral embolism.

2. Retrograde amnesia following blows to the head in which the whole or a portion of the amnesic period spontaneously cleared up.

3. Amnesic states in which the memories were so completely destroyed or dissociated that neither spontaneous restoration occurred or experimental synthesis was possible. In this group may be placed protracted epileptic amnesias and the retrograde amnesias of cerebral concussion not comprised under Group 2.

Cases of amnesia in whom the memory lapses can be restored to the conscious self by means of hypnosis or autosuggestion are usually considered of an hysterical type. However, similar results have been obtained in organic disorders. Shilder[4] reports a case of amnesia secondary to attempted suicide by hanging. By means of hypnosis memory for the amnesic period was completely restored.

The following eight cases are illustrative:

*Case 1.*—Cerebral concussion with retrograde amnesia of two hours' duration.

A woman, aged 25, was admitted to the Neurological Service at the Ancker Hospital with a history that her automobile had collided with another car and she had been hurled to the pavement and rendered unconscious. The neurological examination was negative throughout except that the patient was unconscious, pulse 85, blood pressure, systolic 130, and diastolic 70. She regained consciousness after four hours, felt well except for a severe headache, and was able to leave the hospital the following day. She remembered taking her car out of the garage in Minneapolis, but had no recollection of

driving through that city, calling at a friend's home, and driving through St. Paul, a period of about two hours prior to the accident.

*Case 2*—Severe cerebral concussion with hemorrhage, retrograde amnesia of ten days' and anterograde amnesia of about three weeks' duration.

A man, aged 48, construction foreman, with a negative family and personal history was referred by Dr. A. Conley, Cannon Falls, Minnesota, July 29, 1924. His wife stated that on July 19, 1924, about 8:30 p. m., while her husband was riding horseback, a Buick roadster ran into the horse with such force that the horse was thrown over the auto and the patient hurled to the ground. He was rendered unconscious and remained so for about eighteen hours. He then regained consciousness and had short rational periods. His condition gradually improved and he seemed clearer mentally. On July 27th he complained of diplopia.

During the first four days following the accident his pulse varied between 48 and 72. He was transferred to Mounds Park Hospital July 29th, where I first saw him. He was confused, disoriented as to time and place, and thought this was 1907 or 1913. He could not recall where he lived or what town he came from. He complained of double vision and severe headache.

The neurological examination was negative throughout except that he had a positive Romberg to the right and swayed to the right when attemptng to walk. His pulse was 63, blood pressure, systolic 128, diastolic 75. On August 2d his pulse was 46, a spinal drainage was done, and 40 c. c. of spinal fluid were removed. The fluid was under increased pressure, definitely yellowish, contained a trace of globulin, 80 cells, a negative Wassermann, and a negative colloidal gold curve.

Following the lumbar puncture his head felt clearer and he appeared brighter mentally. Spinal drainage was repeated on August 4th. His mental symptoms were suggestive of a Korsakoff's psychosis. His memory for recent events was impaired and if questioned about the past day or so he would tell about working with his crew, about visiting some neighboring town, about some auto ride he had yesterday, and so forth. He had intervals during which he seemed rational in every way. This condition continued for about two weeks and by August 16th his mental picture had returned to normal. His headaches gradually subsided and by September 15th he was discharged from the hospital. He still complained of diplopia and a tendency at times to stagger to the right. He was seen by Dr. Wm. Lewis who reported that the diplopia was due to a paresis of the right superior rectus eye muscle, which, in a measure, explained his difficulty in walking. He had no recollection of anything since June 9th, ten days before his injury, remembered nothing about his accident, his trip to Mounds Park Hospital, or his stay at the hospital during the first seventeen days, although during a greater portion of this latter period he appeared quite normal.

*Case 3*—Mild cerebral concussion with headache for five days, followed by a period of amnesia, during which the patient wandered away and gradually regained consciousness seven days later.

A man, aged 37 years, a broker, was seen in consultation with Dr. Asa Johnson, St. Paul, February 25, 1926. His family history was negative except that his mother had paralysis agitans. His personal history shows that he had measles at 16 and again at 34; influenza at 31. He was overcome three times with gas from a charcoal burner in a closed freight car. This was not serious but it necessitated his being away from work twice, in February and in December, 1925. He was not unconscious but was very dizzy. He had frequent headaches while working in cars heated with charcoal burners. He denies the use of alcohol, and venereal disease.

On the morning of February 11th he slipped on the ice and fell on the cement sidewalk, striking his shoulder and the back of his head. He complained of severe headache and dizziness. For the next five days he felt miserable. His wife stated that he did not look well, nor did he act like himself. Part of the time he attended to his work. On the afternoon of February 14th he had to go to Minneapolis to inspect some cars. He remembers leaving Minneapolis and driving across the high bridge in St. Paul, but he has no recollection of which way he came, whether it was by the River Drive, University Avenue, or some other street.

On the evening of February 16th, about seven o'clock, he left home to go to his office. After arriving there he telephoned his wife about the furnace. This was the last that was heard of him until February 23d, when found in Peoria, Illinois. He fell over quite suddenly while in a cigar store, became unconscious, and was taken to a hospital. After an hour or so he aroused sufficiently to give his wife's name. The only address he remembered was St. Paul. His clothes and shoes were muddy, and he had not shaved. He had lost about 25 pounds in weight. His automobile was found at Red Wing, Minnesota, in which he had evidently driven from St. Paul.

When the family arrived at the hospital he was afraid to go home. He thought he would give the children measles and talked about it constantly. Three years prior he had given them measles on his return home. He was brought home and stood the trip well. He slept well during the night but had a short attack on the sleeper during which his breathing seemed shallow and his color turned ash-gray. He felt cold and clammy and was aroused with difficulty.

When he was first seen February 25th at 6 p. m. he appeared slightly confused and had no recollection of what had happened from the time he was in his office on February 16th in the evening until he awakened in the hospital February 23d. Since then he has had an occasional twitching of the thumb and first finger of his right hand. He complained of some frontal headache and pain over the bridge of his nose. He had blisters on his feet and seemed quite exhausted. He had a recent scar on his tongue. He stated that when he awakened in the hospital his tongue was sore and swollen. There was a small abrasion about the size

of a nickel on the top of his head. There were bruises on his legs.

The neurological examination was negative throughout. His pulse was 74; blood pressure, systolic 120, diastolic 70; urine normal. There was some tenderness over the bridge of the nose and the forehead. He seemed quite confused, had great difficulty in concentrating, could not remember names, and was unable to do the higher multiplication tables but could do the lower ones and simple addition with great effort. This gradually improved.

He slept fairly well that night. The next morning, February 26th, he got up about 8 a. m., put on his old trousers, his shoes without tying them, the jacket of his pajamas, walked down stairs, and insisted on going to the office. An hour later he had no recollection of this. He was quite well all day. He was given 1.5 grs. of luminal at bedtime. He slept all night and was quite drowsy and somewhat confused the next day. A lumbar puncture was done on the 27th and 25 c. c. of clear spinal fluid under pressure was removed. Following this his head felt clearer and the pain was better. The spinal fluid was clear, contained 2 cells, a negative globulin, a negative Wassermann, and a negative colloidal gold curve. On the morning of the 28th he was quite restless and worried about his business, which his wife said was quite normal.

He made a satisfactory recovery in time except that he has no recollection of anything that transpired between February 15th and February 23d. He evidently sustained a cerebral concussion, which five days later was followed by a period of confusion and amnesia.

*Case 4*—Excessive alcoholism for about ten months, followed by brief periods of confusion with terrifying hallucinations for about nine months, with a period of amnesia of nine months' duration, with complete recovery except for amnesic period.

A male, age 29 years, was seen in consultation with Dr. J. B. Brimhall, St. Paul, December 18, 1925. His family history was negative. His personal history was as follows: He had broncho-pneumonia at 20. While in the service at the Argonne Front with the American Expeditionary Forces he received a blow with a rifle butt on the occipital region of the skull, and sustained a slight cerebral concussion. In August, 1923, he prevented a crazed negro from attacking a friend with a butcher knife. After the excitement subsided the patient became hysterical, had a severe crying spell, was nauseated and very depressed for several hours, but recovered entirely after a good night's rest. He was a successful retail merchant in Spokane, Washington, from 1921 until the fall of 1924. About this time he began to drink, moderately at first, but to excess later on. This continued until July, 1925. About November, 1924, he complained of headaches, dizzy spells, and suffered from periods of nervousness, undue irritability, and depression. He became inconsiderate, unreasonable, and neglected his business. These symptoms gradually became more pronounced. In the spring of 1925 he would have an occasional fainting attack of short duration. His business judgment became very poor, and he lost approximately $22,000 during that spring and summer because of foolish business deals. In July, 1925, he had a severe attack as follows:

While driving an automobile he suddenly stopped his car, said he felt extremely nervous, twitched all over, especially on his left side, and became unconscious for about a minute. This was followed by nausea, pain in the head, and diplopia for a short period. These spells gradually increased in frequency and severity. In August, 1925, his attacks would average about three a day and were accompanied by severe occipital headaches, pain in his left side, and terrifying hallucinations of sight and hearing, such as German soldiers attacking him. He would fight desperately until he was completely exhausted. These attacks varied from one-four to one hour, and were followed by ptosis of the left eyelid and some ataxia of the left extremities. This gradually subsided. He was seen by Dr. George Price of Spokane on August 18, who diagnosed an epidemic encephalitis. A spinal fluid examination at this time was negative throughout. During the next three months six spinal drainages were done, with some relief of the severe headaches. His attacks gradually became more violent and he would have as many as nine in twenty-four hours. He was irrational most of the time. He was brought to St. Paul and taken to St. Luke's Hospital, where I first saw him December 18, 1925. He was extremely restless, at times frightened because of hallucinations of sight; he would grimace frequently; when asked to open his mouth and put out his tongue he responded reluctantly, and would keep his mouth open and his tongue protruded indefinitely until finally told to close it.

The neurological examination was negative except that both knee jerks were sluggish and his left arm and leg seemed somewhat tender. At times the patient was oriented, responded rationally, although quite emotional, and cried frequently. At other times his expression would suddenly change, his pupils would dilate, and he would become terrified, clinch his fist, strike out and scream, "There they come, there they come; they will kill me!" and so forth. Occasionally he would see children and men walk around his room, and would complain of many strange noises. At times he would be violent and disturbed.

Because of these attacks it was necessary to keep him in restraints constantly. Under large doses of morphine, luminal, sulfonal, and so forth, he gradually improved, his spells occurred less frequently, were milder, and one could reason with him when they came on, and he would, in a measure, be able to control them. His temperature, pulse, and all laboratory findings were normal throughout. He left the hospital January 7, 1925, and stayed at his mother's home. He would be free from any attacks for days, during which time he was perfectly rational in every way. He requested to be kept in partial restraint, because he was afraid that the attacks might recur. My associate, Dr. Souster, and the patient had been classmates in High School and they had long conversations about the good old times. The patient's memory was normal and he related de-

tailed experiences correctly about their school days. He read the daily papers and conversed intelligently about current events. He was well oriented as to place and time. Because of the fact that his attacks recurred the family decided to take him to the Mayo Clinic on March 1st. He had quite a severe attack on the train and two crying spells during the first two days at Rochester. On March 4th he suddenly brightened up as if awakening from a bad dream. He said that it felt as if something in his head had snapped and he was certain that he would have no further attacks. From that time on he made rapid progress to complete recovery. However, he had complete loss of memory from July, 1925, until he apparently awakened in Rochester March 4, 1926. He called at my office April 2d. He had no recollection of meeting me before, and knew nothing about his stay at St. Luke's Hospital or at his mother's home. When he met Dr. Souster he remembered him as his classmate in High School, but could not recall any visits with him since that time. His entire illness up to March 4th, including the weeks during which he appeared entirely normal and rational, was a complete blank to him.

This patient evidently had a severe psychosis secondary to his prolonged alcoholism, associated with a complete amnesia of eight months' duration. This case well illustrates the extreme toxicity of the present day alcohol upon the central nervous system.

Lemchen[5] reports a similar case following moonshine whisky in whom the amnesic period was of three months' duration and the recovery as complete as in our patient. He believes that these cases are not true Korsakoff's psychosis for in that type the patient seldom recovers entirely without any evidence of dementia and with good insight.

*Case 5*—Epilepsy, petit mal type, with two periods of retrograde amnesia, of thirty-six hours' and five days' duration respectively.

This patient was a female aged 32, with a negative family and personal history. For the past fifteen years she has had attacks during which she would become momentarily unconscious. Her expression would be blank for a few seconds and then would return to normal. These attacks would occur daily but more frequently during her menstrual period. Following one of these attacks she had a retrograde amnesia of five days' duration. During this period she had assisted her neighbor in the terminal illness and funeral of her husband, but was unable to recall any of these events or other occurrences for five days previous.

About one month later, on her way from Bismarck, North Dakota, to LaCrosse, Wisconsin, she stopped off at St. Paul and was examined at my office. That same afternoon she left for LaCrosse with a friend, and on the train had another petit mal attack. I saw her again one week later, at which time she had no recollection of her previous visit to my office, of her examination, and so forth. She remembered leaving Bismarck, the next station beyond, and getting off at LaCrosse. The intervening period of about thirty-six hours was a complete blank.

*Case 6*—was of a similar nature but associated with a grand mal seizure.

A male, aged 22, student at the University of Minnesota, gave a negative family and personal history. He had suffered from generalized convulsions since the age of fifteen, averaging about four a year. About five o'clock one afternoon he had an attack of epilepsy, grand mal type, of about fifteen minutes' duration. He gradually regained consciousness, but had no recollection of the events of the day. He recalled arising in the morning, but remembered nothing of his day's work except for notes he found in his books which he had taken during the lecture hours. Careful study of these notes and discussing the lectures with his room mate were of no avail in attempting to restore his memory for that period.

*Case 7* was another epileptic who suffered from epileptic equivalents in the nature of epileptic flights of ten and twenty days' duration.

A man, aged 34, was seen in consultation July 2, 1924, and gave the following history of three attacks:

His family and personal history was negative. There was no evidence of grand mal or petit mal seizures. The first attack occurred in the spring of 1911 while working on the farm. He disappeared and ten days later suddenly came to and found himself at another farm house about 120 miles distant. The farmer informed him that he had been there a week and had performed his work properly. He had been rather quiet, but apparently normal. The patient had no recollection of how he got there or what had occurred during the interval. In 1917 he enlisted, and saw active front line duty without manifesting any nervous instability. His second attack occurred in the winter of 1920. He was found by some neighbors wandering through the fields in a heavy snow storm. He was dressed lightly, without hat or coat, and seemed confused. He had walked about six miles from home. He was taken home and his confusion gradually subsided. This attack was of about seven hours' duration. He remembered putting his team in the barn about 3 p. m. and had no further recollection until he found himself in bed about 10 p. m. His third attack occurred on March 10, 1924. He drove to town, sold a horse, and evidently received a check for it, which he deposited. He remembers selling the horse, but has no recollection of getting a check or anything further until March 30th. He suddenly came to and found himself in a depot in Chicago. His clothes were filthy, and he had no funds. The station policeman told him that he had been sitting around the depot all day and had acted apparently normal. There was no evidence of any hysterical manifestation in his makeup.

*Case 8*—Major hysteria, with hysterical flights and six attacks of amnesia of seven months', five months', three days', four days', one month's, and two days' duration, respectively, each attack precipitated by some distressing situation.

The patient is a male aged 30, an attorney, with an

excellent family history except that his mother died of puerperal sepsis when our patient was two years old. He has two sisters. He was educated in private schools and studied law in Georgetown University. During his youth he developed a very independent spirit, wanted his way in everything, and had a violent temper. While in college he was a good mixer and very athletic. He saw active service in France, and was promoted from a private to a first sargeant. He returned to the United States in March 1919. In the fall of 1919 he became a partner in his father's law firm. He married in 1921, his married life was congenial, but he and his wife were extravagant and had constant financial worries. They had one child, born eighteen months after marriage.

While in his father's law office he had periods during which he was quite irritable and manifested a tendency to "blow up" over minor difficulties. In the spring of 1923 he was nominated for district attorney, but was defeated at the election. This was a great disappointment to him. Because of a personal grudge the newly elected district attorney proceeded to bring charges against the patient for wrongfully using funds from an estate of which the patient was administrator. No charges were proven, the relatives made no complaints, and the matter was dropped. This occurred in the early fall of 1923. During the investigation the patient was under great tension and felt quite disgraced because of the charges preferred against him. He began to neglect his business, and felt as if there was "no use." He repeatedly overdrew his bank account and made several business trips without any motive. He had difficulties with his father and was worried because of this. Around Christmas 1923, he suddenly disappeared and regained consciousness January 15, 1924, in a hospital at San Diego, California, about 1200 miles from his home. He had been found apparently unconscious, two days previous, in front of a mountain resort about sixty miles from San Diego. When he regained consciousness he was unable to give any information pertaining to himself or his family. The name of a man in San Diego was found on an envelope in his pocket, who came and identified him. After awhile the patient was told who he was and that he had a wife and child. This information greatly disturbed him and he cried for several hours. His memory gradually returned except for a period from July 1923, to January 15, 1924. He left the hospital February 10th and returned home in April 1924, for five months. At home he stayed around the house, seemed depressed, avoided his friends, and felt disgusted with himself. In August 1924, he worked with a surveying crew for one month. Early in October he went to Colorado to attend to some important legal affairs for his father. He states that this turned out to be a "dismal failure" and that he was greatly disappointed. He remembers going to bed the latter part of October 1924, in Colorado, greatly worried, and then suddenly "came to" in a tourists' camp in Kansas City, April 25, 1925. One of the tourists informed him that he was walking along the road, asked for a ride, and was brought to the tourist camp. There he suddenly fainted but within a short time regained consciousness with a return of his memory.

History from other sources reveals the following regarding this period of amnesia from October 1924, to April 1925: Nothing could be learned of his whereabouts until December 24th. On December 24th he was on a train in New Mexico, introduced himself as John Blank (he did not use his own name) to one of his fellow passengers, told him that he had been a lieutenant in the Coast Artillery, that he had been shell shocked, and suffered with spells of unconsciousness which occurred quite frequently and lasted a week or more. He begged him to take care of him in case he should develop an attack. They registered at the same hotel and took a room together. Within a few days the patient suddenly collapsed and was sent to a hospital. He remained in an hysterical semi-conscious state for four days and then gradually returned to normal. He had no recollection of anything since October 1918. He remained in this hospital until March 10, 1925, and was then taken to another hospital in Kansas City, where he remained until April 25, 1925. He seemed normal in every way. That afternoon he "came to" in the tourists' camp. He was returned to the hospital, his memory gradually returned except for his amnesic periods, and he was discharged May 15, 1925, and advised to go to northern Minnesota to recuperate. He arrived in Duluth June 1st, and lived at one of the smaller hotels until July 1st. He then attempted to do manual labor in the copper mines in northern Michigan. He could not stand the work and lost his job within three weeks. He returned to Duluth quite upset over this failure. He developed a severe headache and applied to the Veterans' Bureau for admission to the hospital because he feared another attack. From here he was transferred to St. Paul, and I first saw him September 10, 1925. He appeared normal in every way, complained of an occasional occipital headache, stated that he had lost confidence in himself because of his repeated attacks of amnesia, and because of his many failures in life. All examinations and laboratory tests were negative. He progressed satisfactorily. After several frank discussions with him about his condition he became more cooperative, regained some of his confidence and asked to be discharged on October 17, 1925. He went to Chicago and visited some old friends, which seemed to upset him. He secured a position as a salesman, making $6 a day. He continued with this for two weeks then began to realize that there was no future in it for him and resigned He furthermore had some difficulties about the adjustment of his government compensation, which worried him greatly. He remembers going to bed in Chicago on November 20, 1925, and found himself in a Duluth hospital three days later. He has no recollection of the intervening period. He remained in the hospital for three weeks, then secured a position as salesman for four weeks, succeeded quite well, but was dissatisfied and discontented with his work About January 20, 1926, he was found in his room in a semi-conscious condition, which continued for four days, with recovery. He left Duluth, arrived in St. Paul, and remembers staying at the St. Paul

Hotel. On February 20th he suddenly "came to" in a hospital in Milwaukee, but has no recollection of what occurred during that month. He requested that he be transferred to the Veterans' Bureau Hospital in St. Paul and arrived here on February 22d. He remained here until May 1, 1926, when he was discharged from the hospital as he wanted to go to Northern Minnesota to recuperate. During his stay at the hospital he was normal in every way except for two day, March 15th and 16th. On March 11th he received a very upsetting letter from his wife and on March 12th a letter from a friend, demanding the payment of a $75 loan. On the evening of March 14th he seemed rather depressed, retired early, apparently slept all night, but could not be aroused next morning. He appeared semi-conscious, resisted attempts to open his eyelids, and to move his arms. After repeated demands he finally opened his eyes, stared, and protruded his tongue. This condition continued for two days then gradually subsided. All findings were negative. He has no recollection of anything that occurred during this period.

The following letter (an exact copy) evidently written on the evening of March 14th, was found at his bedside, and quite clearly illustrates his mental attitude toward life's problems and toward his own incompetency:

"Dear Pal:

"Some say it is the coward who takes the *easiest way* out of a difficulty but I disagree, it takes more courage than most of us have to go on living, making life a daily torture. I am a coward. I go on living my worthless life, hoping somewhere there might be a ray of light in the dark horizon to guide me. I know how you have encouraged me 'Audeces Fortuna Juva' as a motto. I have tried, old pal, but every time I begin to regain my lost confidence, something happens to undermine it.

"Stripping away all veneer and leaving the bare facts, what does the future hold for me? I am nothing but dross; all the steel has been melted out of me.

"Even here in the hospital I do not have any rest. Always something to worry me. No compensation, everything else gone, as you know. Grant crying for payment. Thought I had that arranged for, but alas, today that fell through and now I do not know where to turn. I know, old pal, you would help if possible but I know how you are situated. I tried last winter to come back, but I make a miserable failure, more than that, in my failures make someone else must suffer. Grant will be paid but I can't say when. Oh! but why bore you with this. I must talk to someone, so please bear with me a little while. I don't know why I should be condemned to suffer so. Full conscious that I have all my faculties, yet some damnable lack of coordination has me at least abnormal. Some, as you know, call it a dual personality, a semi-hypnotic state. That may be all true, but God, if I only could get somewhere, where I could rest, where my mind could be relieved of this continuous worry. If people would only let me alone somewhere I did not have to worry where my next meal is coming from. I am tired, want to sleep so will continue this later. Guess I'll take a bath maybe it will make me feel better."

Case reports of hysterical amnesia are encountered quite frequently in the literature. Read[6] published a case in detail in whom a complete retrograde amnesia existed for a period of eight years, secondary to a slight head trauma. Oppenheim[7] cites a similar case in an army officer. Shell shock patients during the World War often manifested periods of amnesia, usually on an hysterical basis and were successfully treated by hypnosis (Thome[8]).

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9. Lewandowsky: Handbuch der Neurologie.

## ALLONAL NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that Allonal is a preparation containing a combination of allylisopropyl barbituric acid and amidopyrine mixed with free allylisopropylvarbituric acid and an excess of amidopyrine. The combination between allylisopropylbarbiburic acid and amidopyrine is readily decomposed into its components, and the firm's claims are based on the assumption that Allonal contains these two ingredients. The claim is made that allylisopropylbarbituric acid, "the new and distinctive component," possesses a greater hypnotic power than any of the other well known hypnotics of the barbituric acid series, but that it is relatively less toxic. The Council finds that the evidence cited by the firm does not substantiate this claim, and concludes that Allonal must be considered as the result of an effort to combine in one preparation the hypnotic properties of a member of the barbituric acid series and the analgesic properties of amidopyrine. The firm publishes long lists of conditions said to have been relieved by this combination, the only individualization being the recommendation of "1 to 2 tablets" for some and of "2 to 4 tablets" for others. In none of the clinical reports submitted by the firm does the author refer to observations in which either component of the drug was used separately or in which the relative proportion was varied: the Council holds that the absence of such data deprives these reports of much of their value as arguments for the use of Allonal. The new hypnotic, allylisopropylbarbituric acid, for which great superiority is claimed, is thus made available to physicians only in fixed combination with an antipyretic and analgesic drug which may not be needed and which in itself frequently causes untoward symptoms. The Council finds Allonal unacceptable for New and Nonofficial Remedies because (1) the therapeutic claims advanced are deemed unwarranted by the facts; (2) the name is not descriptive of its composition, and (3) there is no satisfactory evidence that the administration of a mixture of allylisopropylbarbituric acid and amidopyrine in fixed proportion (or of a feeble chemical compound of these two that behaves in the stomach like a mixture) is rational. (Jour. A. M. A., June 12, 1926, p. 1853).

# HYDROCEPHALUS*

EINER W. JOHNSON, M.D.
*Bemidji, Minnesota*

Hydrocephalus has hitherto ranked as one of the most intractable and unpromising of the diseases of childhood. A multitude of surgical procedures have from time to time been instituted for the relief of the condition but almost without exception they have failed in their purpose, and the rare occasions on which they have succeeded have left one wondering whether, after all, the success was no more than coincidence—whether, in fact, improvement would have occured if nothing active had been done, for spontaneous arrest of hydrocephalus is an actual, though rare, possibility. This unsatisfactory state of affairs depended largely upon erroneous ideas regarding the etiology of the disease.

As early as 1862 Hilton, in his Lectures on Rest and Pain, described varieties of obstructive hydrocephalus arising from congenital obliteration of the aqueduct of Sylvius, and from occulsion of the foramina present in the roof of the fourth ventricle. The clue to the pathological process in certain types of the disease does not appear to have produced in the past any operative interference of lasting and definite value, and we owe to Dandy and his co-workers the establishment of operative principles which hold out the prospect, as far as we can at present tell, of permanent cure of the disease.

The following short description of the condition was taken from the lectures, demonstrations and writings of Mr. John Frazer, Professor of Surgery of Edinburgh University, Edinburgh, Scotland.

### NORMAL ANATOMY AND PHYSIOLOGY OF THE PARTS INVOLVED

It is essential to have a proper idea of the processes involved in the production and absorption of the cerebro-spinal fluid, and of the relationship of the parts connected with its circulation. Such knowledge is fundamental because the development of hydrocephalus necessarily entails an error either in the production, circulation or absorption of the fluid.

### PRODUCTION OF THE CEREBRO-SPINAL FLUID

We may assume that the bulk of the cerebro-spinal fluid is derived from choroid plexuses which lie in the lateral ventricles. The method by which the fluid actually is produced from the villi is uncertain. It is not yet possible to say whether the process is one of secretion, filtration or dialysation. The fluid differs so widely from that secreted by most other glands, and it persistently retains its freedom from contamination by such body fluids as bile in jaundice, or by drugs when they are injected into the body, that we must assume that whatever the method of production, certain strong selective actions are at work.

Another possible source of the production of the cerebro-spinal fluid exists in the perivascular spaces. They communicate with the subarachnoid space and therefore the fluid of the former must to some extent be included in the cerebro-spinal fluid.

### COURSE OF THE FLUID AFTER PRODUCTION

The fluid circulates along the ventricular system and escapes from it through the medium of the central rounded foramina of Magendie, and the more slit like lateral foramina of Lushcka. It is now in the subarachnoid space, and at first it tends to collect in the large subarachnoid cistern which lies at the base of the brain, the cisterna magna on the dorsal aspect and the cisterna pontis with its various sub-divisions on the ventral aspect.

The value of the cisterns is two fold—they stabilize the pressure of the cerebro-spinal fluid, and they render possible a uniform distribution of the fluid in its further progress over the cerebral hemisphere. From the subarachnoid spaces and cisterns the fluid passes in two directions. A small proportion passes downward through the foramen magnum into the subarachnoid space. The larger proportion escapes upwards between the mid-brain and tentorium cerebelli to be distributed in the wide area of the subarachnoid which covers the cerebral hemisphere. It is in this area that absorption of the fluid occurs.

### METHOD OF ABSORPTION OF THE FLUID

It is generally held that there are four media by which the fluid is absorbed, namely, the pacchionian bodies, the arachnoid villi, arachnoid mesothelial cells, and the lymphatic system.

### THE SPECIAL ANATOMY INVOLVED

The large proportion of the cerebro-spinal fluid is formed within the lateral ventricle in which lies the bulk of the choroid plexus. The fluid

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, May, 1926.

passes by the foramina of Monro into the third ventricle. This ventricle contains a choroid plexus, and therefore it is the site of production of a certain amount of cerebro-spinal fluid. The fluid leaves the third ventricle by the sylvian aqueduct to pass into the fourth ventricle. The lumen of the sylvian aqueduct is somewhat narrower at its two extremities, a point of importance in connection with congenital obstructive hydrocephalus. In the roof of the fourth ventricle are three apertures; the foramen of Magendie which appears during the fifth fetal month and two additional clefts, the foramina of Luschka. Through these three aperatures, and probably through them alone, the system of ventricular cavities and central canal of the spinal cord are brought into communication with the subarachnoid space. Three groups of choroid plexus appear in the roof of the fourth ventricle—a medial and two lateral—and therefore a proportion of cerebro-spinal fluid is formed within this space. Having escaped from the fourth ventricle into the subarachnoid space by the foramina Magendie and Luschka, the fluid is free to pass forward over the hemispheres or caudally into the spinal subarachnoid space.

### ESSENTIAL ERROR IN THE FORMATION OF A HYDROCEPHALUS

By the terms hydrocephalus we mean an accumulation of cerebro-spinal fluid within the cavity of the skull. Keeping in view the outline which we have given of formation, circulation and absorption of the cerebro-spinal fluid, we may classify the possible origins of the disease as follows:

1. Excessive production of fluid;
2. Obstruction in some portion of the route along which the fluid circulates;
3. The production and circulation of the fluid remaining normal, there may be an interference with the absorption of the fluid.

Based on these three possibilities, a reasonable and scientific classification of the disease can be made which will include moreover all varieties of the disease.

### VARIETIES OF CLASSIFICATION

Hitherto different varieties of hydrocephalus were recognized in describing the disease. For example, hydrocephalus was classified as "acute" or "chronic" according to the rapidity with which the fluid accumulates, or dependent on its association with coincident acute inflammatory reaction in the meningeal structures. Hydrocephalus was spoken of as "internal" or "external," according to whether the fluid accumulates within the ventricular system or in the extra cerebral tissue of the arachnoid spaces. Further, the disease was classified as "congenital" or "acquired," according to the history of its incidence and occurrence. Such an irregular and rambling classification had no proper basis. The occurrence of an external hydrocephalus as a primary condition distinct from a co-existing internal hydrocephalus has been questioned, and its occurrence is universally accepted as a very rare condition. The classification of "acute" and "chronic" hydrocephalus was specially important. Apparently in the minds of many observers acute hydrocephalus was synonymous with the development of basal meningitis. But, whatever the origin of the condition, all varieties of hydrocephalus are chronic in their formation, though the actual period of time involved may vary within wide limits.

Something is to be said for the method of classification into "congenital" and "acquired" varieties of the disease. A considerable proportion of cases can be without much difficulty, grouped into one or the other of these classes—but the independent use of the two terms is not sufficiently descriptive of the condition of affairs.

The classification suggested by Dandy is complete but it includes types of the disease which, if they actually exist as clinical entities, have little or no relationship to surgical treatment.

On the grounds above stated Frazer suggests the following as a more suitable classification:

Hydrocephalus due to
- a—Congenital anomalies
- b—Ventricular obstruction
  1. Between one lateral and third ventricle.
  2. Between both lateral ventricle and third ventricle.
  3. Between the third and fourth ventricle.
  4. In the roof of the fourth ventricle.
- c—Extra ventricular obstruction
  In the subarachnoid space.

The above is a simple, expressive and accurate classification from the anatomical and physiological points of view. It is also very significant practically, for each type has its distinctive and appropriate treatment.

ETIOLOGICAL PATHOLOGY

1. Congenital hydrocephalus.

Two varieties of hydrocephalus have been encountered at birth, and therefore the varieties may be described as examples of congenital types:

A. There is a well developed form in which the head is considerably enlarged at birth and which is associated with an error in the development of the central nervous system and which permits an escape of fluid from an open sylvian aqueduct. The resulting hydrocephalus is of an external type, is not amenable to surgical treatment and is rarely compatible with post-natal life for any prolonged period.

B. The variety of hydrocephalus which accompanies a spina bifida. At birth attention is naturally directed to the spinal error, and if the spina bifida is operated on and the defect closed, the pre-existing hydrocephalus soon becomes noticeable by the rapid increase in the size of the head. This variety of hydrocephalus is also of the extra-ventricular type.

2. Ventricular hydrocephalus resulting from tumor, atresia and adhesions.

Tumors usually occur at the cerebello-pontine angle and the resulting hydrocephalus is not a primary one.

Atresia and adhesions have a common basis in so far as both varieties have an inflammatory origin, plastic or infective. The possible origin of ventricular hydrocephalus may be dependent upon intra-cranial birth hemorrhage, a former sub-acute inflammatory meningeal condition, or the lepto-meningitis which develops in association with congenital syphilis.

3. Etiology of extra-ventricular hydrocephalus.

Dandy's view as to the anatomical lesion responsible for this type, namely, pia-arachnoid adhesions which shut off the absorbing area of the cerebral subarachnoid space from the posterior cranial fossa, has a great deal to recommend it. The possibility that there is an over production of cerebro-spinal fluid has never been established; the only other possible explanation is a diminished absorption of the cerebro-spinal fluid. The difficulty has been to explain what prevents the absorption of the fluid. The actual origin of the adhesions in extra ventricular hydrocephalus is that already discussed in relation to the ventricular type, except at birth hemorrhages probably do not play a part. Basal meningitis, simple or specific, is the more likely origin.

PHYSICAL EXAMINATION OF THE CASE

In the majority of cases it is sufficiently obvious that a hydrocephalus is present but a further examination is necessary to properly classify it as regards its etiology and type. Recognizing that practically all cases of hydrocephalus are obstructive, it is necessary to demonstrate whether the obstruction exists somewhere in the ventricular system up to and including the point of exit of the fluid from the fourth ventricle, or whether it exists in the subarachnoid spaces. Three procedures are followed in demonstrating the answer to this question:

1. Lumbar puncture may give some indication, but not a definite answer to the question. Intra-ventricular hydrocephalus more often shows low tension in the spinal fluid and extra-ventricular hydrocephalus on increased tension, but variations exist, and occasionally this is reversed.

2. A neutral solution of phenolsulphonephthaline is injected into one of the lateral ventricles and in five minutes or more, if the indicator can be recovered by spinal puncture it can be concluded that the hydrocephalus is not due to an intra-ventricular obstruction. The non-appearance of the indicator in the spinal fluid may be taken as demonstrating an intra-ventricular hydrocephalus.

3. The recovery of phenolsulphonephthaline from the urine subsequent to its injection into the ventricle is a matter of importance, for if a ventricular hydrocephalus exists, practically none of the indicator will be recoverable within a reasonable time (two hours), while if an extra ventricular hydrocephalus is present, the indicator will be recoverable, though not to the same degree as in a normal case.

Investigation by these methods, and more especially by the second, carries the observer a step forward, in so far as he is now able to classify the case of hydrocephalus into a ventricular or an extra-ventricular type. If it should happen that the case is an extra-ventricular one, it is not necessary to proceed further with the routine examination. If, however, our original investigation has shown that the hydrocephalus is a ventricular one, further details must be determined

before an intelligent operative treatment can be undertaken.

The degree of hydrocephalus must be known, and the situation of the obstruction must be localized. This knowledge is gained by the method of ventriculography. One lateral ventricle is punctured, and to the needle an accurately fitting "record" syringe of 20 c.c. capacity is fitted. The cerebro-spinal fluid is slowly recovered from the cavity of the ventricle, and when 20 c.c. are evacuated, a corresponding amount of air is injected into the ventricle, using the empty record syringe for this purpose. In a hydrocephalus of moderate size (eighteen to nineteen inches in circumference) 70 to 80 c.c. of fluid is recovered, replacing the fluid with a corresponding quantity of air.

Radiograms are now taken with the head in three different positions—right and left lateral and with the head hanging downwards so that the skull base is at the highest level. The first plate will show the outline of one lateral ventricle, the second will demonstrate the opposite ventricle—assuming that the foramina of Monro and the third ventricle are patent—while the third plate will illustrate the third and fourth ventricle and the iter.

### TREATMENT

If the efficient treatment of hydrocephalus is to give us satisfactory results it must be carried out before the expansion of the head has become too marked. There is nothing to be gained from operating on a child if the white matter of the brain is already reduced to a shell. No definite limit can be fixed; it must be left a good deal to personal judgment; but an increase in circumference measurement up to three inches above the normal has been found to be within the range of satisfactory post operative recovery. It is obvious that a very clear distinction must be drawn from the operative point of view between the ventricular and extra ventricular varieties. Both are certainly obstructive in nature, but while one (ventricular) is localized and accessible, the other (extra ventricular) is diffuse, and practically inaccessible.

If the hydrocephalus is of the ventricular variety, experience has shown that the only efficient way of treating the hydrocephalus is by removing the obstruction, and so opening up the normal passage for the circulation of cerebro-spinal fluid. All examples of ventricular hydrocephalus, with the exception of the very rare first and second degrees, are operated on by the occipital route. The essential feature of the sub-occipital operation is to expose that portion of the ventricular system which is most accessible, namely, the roof of the fourth ventricle, and through this region to deal with or remove the obstruction which exists. If the hydrocephalus is of the fourth degree it is the custom of Frazer to remove a diamond-shaped area of tela choroidea with fine spring forceps and eye scissors fitted with long angle handles. If it should happen that the hydrocephalus is of the third dgree the obstruction in the iter is generally at one or the other extremities. If a fine rubber catheter will not pass, a millimetre probe is used to open up the closed communication.

It has been found unnecessary to leave a catheter in the iter as it seems that the restoration of the flow of the cerebro-spinal fluid is sufficient to keep the channel open. If this operation is to be a successful one, the relief of the obstruction must be followed by a most careful closure of the wound. If the tension in the post-operative period becomes marked, a ventricular puncture should be practiced and if necessary repeatd.

### TREATMENT OF EXTRA VENTRICULAR HYDROCEPHALUS

The obstruction in this type is a widespread adhesive one at the base of the brain, and it is therefore inaccessible to direct removal. It has to be borne in mind, however, that certain cases of extra-ventricular variety show a spontaneous arrest of the disease, a possibility which can never be hoped for in the ventricular variety. At the present time attempts at treatment have been directed towards diminishing the production of the cerebro-spinal fluid to such an extent as to bring it within the power of absorption which exists, for of course a certain degree of absorption still continues. Dandy has advised the removal of the choroid plexus within the lateral ventricle, and he has published successful results in several cases.

Intra-ventricular plexectomy is an exceedingly grave operation, and there is no physiological proof that removal of a limited amount of choroid plexus proportionately diminishes the production of the cerebro-spinal fluid. Stils suggested the possibility of diminishing the produc-

tion of the fluid by ligation of the common carotids and in 1898 and again in 1912 he reported favorable results from this operation. It is clear, of course, that it is only the extra-ventricular variety which will benefit by this procedure; its employment in the ventricular variety will inevitably lead to disappointment, and this may to some extent explain the adverse criticism which the method has received. Frazer treats all his cases in this manner and his results have been sufficiently promising to warrant the continuation of the method.

RESULTS

The results of the above treatment by Frazer have been in the ventricular type fourteen per cent cured, and in the extra-ventricular type fifty per cent markedly improved. By cure is meant that after a period of seven months the head is diminished in size, the ossification is apparently complete except at the anterior fontanelle. The children seem to be intelligent and in appearance indicate normal development.

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## THE BLAIR BELL LEAD TREATMENT

And while I am offering this counsel in respect to the prevention of cancer, it may be well to speak of another startling announcement which was made a few months ago. I refer to the Blair Bell lead treatment for the cure of cancer. Prof. Blair Bell is a distinguished gynecologist of Liverpool, who has a method of treating cancer patients with colloidal solutions of lead and has accomplished some remarkable results. Associated with him are a number of other physicians of good standing. Reports giving some of the details of the treatment and the results of the work have been published in the *British Medical Journal*. Briefly many persons declared to be incurable by means of surgery and irradiation have been made well. At the same time, a good many have died. The theory is that the lead attacks the cancer tissues and destroys them when given to the patient in doses too small to destroy the normal health tissues. It is a matter of great delicacy to determine and administer the proper dose. Dr. Blair Bell, in all his utterances, lays great stress upon this matter. It is said that no one but himself ventures to administer the treatment. The lead cure for cancer is still in an experimental stage, as every one connected with it freely acknowledges. The work which has been done offers, however, a shred of hope which scientific investigators, the medical profession and the general public are eagerly seizing upon. (Am. Soc. Control cancers, July, 1926.)

## MEDICAL LEGISLATION*

E. KLAVENESS, M.D.
*Monticello, Minn.*

"Life is not mere living, but the enjoyment of health." Martial, Epigrammata.

"Oh health; health; the blessing of the rich; the riches of the poor; who can buy at too dear a rate, since there is no enjoying the world without thee. Be not then so sparing of your purses, honorable gentlemen."—Ben Johnson, Volpone, Act 2.

Utterances like those quoted could easily be multiplied if it were the sole purpose of my address to prove from history or literature that individual or public health has always been highly esteemed by all enlightened men in all ages, whether in antiquity or modern times. And while in our own country our illustrous Benjamin Franklin coined the slogan, that "Public health is public wealth," it is nevertheless a painful fact, well known to every student of medical history and to every practitioner of medicine of some years' of experience that proper legislative enactments embodying a true appraisal of this priceless blessing have been very tardy, and the funds appropriated for securing, maintaining and making more general this happy condition have been rather scanty, yea, at times and in some of our states even niggardly. Whatever beautiful words have been spoken or written in praise of health, individually or collectively, since the dawn of time and up to our present era fade away into nothingness when contrasted with the public records and facts regularly written in our legislative halls. And what are these facts right here in Minnesota? You all remember that in the fall of 1924 we had a disgraceful epidemic of smallpox which for several months held sway all over the state, and thus disturbed our tranquility of mind as well as our long cherished belief of living in a cultured and well governed state. Minnesota is a rich state, as evidence of which I need only mention that in 1917 the assessed value of all real and personal property in the state amounted to more than two and a half billions of dollars. Great as this sum is it sinks in to a modest figure when compared with the economic value of the human beings that inhabit this state.

*Read before the Wright County Medical Society, Buffalo, Minn., May 12, 1926.

During the last world war our federal government placed a valuation of $10,000.00 on every soldier enlisted or drafted, and if we apply this figure as representing the economic value to the state of every human being within the state, and place the total population at 2,700,000 we arrive at the bewildering sum of twenty-seven billions of dollars as the capital wealth represented by our population. The duty as well as the care of looking after a going concern with such immense capital, involving real, personal and human values as stated, we, the citizens, delegate to our government, elected every second year. Strange to relate, neither the people nor the state constitution have provided adequate recognition for the proper safeguarding of the human element, constituting by far the greater portion of the total capital. In the governor's cabinet the railroads and allied interests are represented by a commission, consisting of three members, duly elected. The attorney general represents the state in all legal matters, while the state auditor and the state treasurer are concerned with all real property in the state, and the taxes to be levied on them and collected. The duties of the secretary of state are rather difficult to define briefly because he is not only the responsible officer who countersigns all documents signed by the governor, but his time is also given liberally to issuing charters to corporations and licenses to automobiles.

Neither in the state government nor in the federal government has the tremendous importance of public health been recognized by a distinct cabinet member, chosen from the medical profession. To be sure, we have in our state a commission, appointed by the governor, the state board of health, but really and speaking charitably this commission is not organized for effective work, nor is it supplied with sufficient authority and funds in keeping with the important task allotted to its supervision. And finally our state board of health cannot expect coordinate efficient work out in the state when the respective minor political units—the counties—do not centralize all health-work in the hands of one competent and interested medical man. At present the county looks on in silence while the cities and villages within the county appoint their own local health officers, frequently a friend or for years the family physician of some of the council members, but otherwise not especially fitted for this particular kind of health work.

From what I have submitted of an analysis of our state health legislation it will be manifest that I favor a revision that will give to us a public health department supervised by a secretary of health who may be elected by the people or appointed by the governor after recommendation by our state medical association. Merit and knowledge alone must be the guiding requirements for creditably filling this position. To obtain coordinate efficiency all over the state it further follows that it must be incumbent upon the secretary of health to appoint all county health officers. A compulsory vaccination law should be passed, and finally sufficient funds must be appropriated so that the various subdivisions of such a department of health can functionate properly, thus guaranteeing the citizens of the state protection from preventable diseases. Even though this programme of mine may sound too idealistic to ever be put in operation, I am convinced that a medical profession not hampered by obstructionists either sectarians or the followers of various incredible systems that an ill advised legislature has from time to time recognized and licensed, could and would eventually succeed in placing on our statute book a health law that would be a credit to ourselves and our state. By conferring a perennial blessing upon our citizens through increasing our state of health and reducing our mortality from both preventable and degenerative diseases such a law would be counted the best investment ever made by the state. Certain it is that in our day and age public health is purchasable, and such being the general concensus of opinion our state medical association can with good grace address itself to our legislature in the words of Ben Johnson, already quoted at the outset of this review. Our state board of health which has the supervision of our public health was created by legislative enactment in 1878 so far as I have been able to ascertain, and at present in conformity with the amended law of 1923 consists of nine members. Not to dwell any longer upon this particular legislation I beg leave to refer to a former address of mine dealing with the same subject and published in April 1919 in Medical Insurance and Health Conservation.

In our further study of medical legislation in our state we find that the next move made by our legislators also took place in 1878, when a state

board of medical examiners was created by law. This legislation was termed "An act to regulate the practice of medicine," and at present it is safe to say that every state in the union has placed on its statute book a similar act whereby the people have sought to protect themselves against unworthy and irresponsible practitioners. In this manner doctors, both good and bad, have been singled out as a class on which the people through their legislatures have imposed certain restrictions —contrary to the federal constitution—and have demanded compliance with certain requirements before any member of our profession could lawfully make use of his training, knowledge and experience in any state. For further detailed analysis of the correctness of this act I must refer you to an article of mine in the St. Paul Medical Journal for 1906, where (page 770) under the heading "Reciprocity in Medical Licensure" I submitted my reasons for not acquiescing in this kind of state medical legislation. My viewpoint has not been altered in the intervening years; and as deeds speak louder than words I now observe with pleasure a more general acceptance by a number of states of medical graduates who have successfully passed the examination given them by our National Board of Medical Examiners; and thus it comes to pass that in a round about way the soundness of my argumentation twenty years ago is sustained. If then it be permissible to say that our state legislature erred in 1878, when a commission, a political body of seven men appointed by the governor, was granted authority to license medical men, must we not censure the people's representatives, the legislators, much more for recognizing and lending the State's good name and reputation to inferior or sham systems of the healing art?

The first painful breakdown took place when the Osteopathic State Board of Examiners was created in 1903 by a law enacted by our legislature and signed by our governor, and not very many years later the legislature put its stamp of approval on a far more halfbaked system when in 1905 a board of Chiropractic examiners was proposed. Fortunately for the state we had at that time a real governor, the Honorable John A. Johnson, who promptly vetoed this law and thus for some time saved the face of our state and compelled this sectarian cult to keep hands off in Minnesota.

Subsequent events tell us however that another legislature and another governor jointly committed the sin of fastening this incredibly loose-jointed system upon our people in spite of vigorous protests from the medical profession which cannot help but feel greatly humiliated by these legislative class measures begun in 1878 and culminating in the recognition of the chiropractors.

Aside from the medical practice act and its various subsequent revisions it cannot be said that the legislature has been overworked in the interest of the medical profession; in fact there would seem to be an utter void in the records of our legislative assemblies so far as medical measures are concerned up to last year when our profession by united efforts and the admirable generalship of our present state president, Dr. Herman Johnson, succeeded in obtaining a long sought relief when by legislative enactment it was decreed that actions for damages in malpractice suits must be commenced within two years of the alleged damage and not as heretofore within six years.

Inasmuch as I have so far confined myself wholly to the medical legislation passed by the legislature of our state I must decline to yield to the temptation to also give a review of whatever federal medical legislation we have been "blessed" with during the last ten to fifteen years. Suffice it to say that since the passage of the Harrison law and the prohibition law the doctors of our country have suffered a serious curtailment in exercising the rights and privileges of their license which doctors in other civilized countries still possess. A more extended analysis of this congressional meddlesome interference I have given in my paper "The doctor and his license" published May 15, 1923, in the *"Journal-Lancet"* to which interested parties are referred.

Taking it all in all and summing up the results of both state and congressional medical legislation it may be frankly admitted that the life and practice of a doctor of medicine now more than ever has ceased to be an unalloyed joy. If by reason of our state legislation we are not to sacrifice our professional training and time honored ethics for base commercialism it will be due exclusively to our inborn love for serving our fellowmen while still obeying the call to duty that first thrilled us and made us decide upon a life career as a follower of Aesculapius and his art.

# MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

## LICENTIATES OF APRIL, 1926

### BY EXAMINATION

| NAME | SCHOOL OF GRADUATION | ADDRESS |
|---|---|---|
| Berglund, Hilding | Karolingian Med. & Surgical Inst., Sweden, 1916 | University of Minnesota, Minneapolis. |
| Biersborn, Byron Maxwell | U. of Minn. M. B. 1925 | University Hospital, Minneapolis. |
| Birkeland, Ivar Wessel | Royal Fredk. U. of Oslo, Norway, 1924 | Scenic, Washington. |
| Bloomberg, Clarence Edward | U. of Minn. M. B. 1926 | 329 Union, SE., Minneapolis. |
| Bodine, Marc Williams | U. of Pa. M.D. 1924 | Rochester, Minn. |
| Branley, Bernard Lincoln | U. of Minn. M.B. 1926 | 610 W. 32nd St., Minneapolis. |
| Brown, Felix Manning, Jr. | Vanderbilt, M.D. 1924 | Rochester, Minn. |
| Cervenka, Chas. Francis | U. of Minn. M.B. 1926 | 603 E. River Road, Minneapolis. |
| Clark, Daniel Maurice | U. of Minn. M.B. 1926 | St. Mary's Hospital, Duluth, Minn. |
| Dordal, John | U. of Minn. M.B. 1925 | 605 Erie, SE., Minneapolis. |
| Felland, Oscar M. | U. of Minn. M.B. 1926 | General Hospital, Minneapolis. |
| Green, Geo. Francis | U. of Mich. M.D. 1924 | Rochester, Minn. |
| Heiam, Wm. Conrad | U. of Minn. M.B. 1926 | 329 Union, SE., Minneapolis. |
| King, Jos. Thos. | U. of Minn. M.D. 1925 | 510 Ontario, SE., Minneapolis. |
| Loney, Wm. R. R. | U. of Minn. M.B. 1925 | 3800 Portland, Minneapolis. |
| Malmgren, Geo. E. | U. of Minn. M.B. 1926 | 254 Maria, St. Paul. |
| Netz, Lester W. | U. of Minn. M.B. 1926 | 4309 Colfax, Minneapolis. |
| Peterson, Herbert Wm. | U. of Ill. Cert. Med. 1925 | 1514 E. 18th St., Minneapolis. |
| Pollard, Donald W. | U. of Minn. M.B. 1926 | General Hospital, Minneapolis. |
| Rowles, Everett H. | U. of M.D. 1926 | Swedish Hospital, Minneapolis. |
| Shugrue, John Joseph | Georgetown, M.D. 1919 | Rochester, Minn. |
| Stein, Raymond James | U. of Minn. M.B. 1926 | Holdingford, Minn. |
| Stephens, Brooks Palmer | U. of Kansas, M.D. 1921 | Rochester, Minn. |
| Vandersluis, Harold H. | U. of Minn. M.B. 1926 | Fergus Falls, Minn. |
| Venables, Alex. Evan | U. Manitoba, M.D. 1917 | 1339 Sargent, St. Paul. |
| Waller, Riley Moore | Wash. U. Mo. M.D. 1920 | Rochester, Minn. |
| Weinauer, Heribert Friedrich | U. of Munich, 1925 | Binghamton, N. Y. |
| Werner, Robert Frederic | U. of Minn. M.B. 1926 | 629 Washington, SE., Minneapolis. |
| Westby, Magnus | U. of Minn. M.B. 1926 | 329 Union, SE., Minneapolis. |
| Wilken, Paul Arthur | U. of Minn. M.B. 1926 | 3912 Pleasant, Minneapolis. |
| Yaeger, Wilbert Wm. | U. of Minn. M.B. 1926 | Sanborn, Minn. |

### BY RECIPROCITY

| | | |
|---|---|---|
| Alvarez, Walter Clement | Cooper Med.Coll.Cal.M.D.1905 | Rochester, Minn. |
| Gehlen, Jos. Nicholas | Creighton, M.D. 1918 | Lowry Bldg., St. Paul. |
| Grogan, John Sebastian | Northwestern, M.D. 1914 | Wadena, Minn. |
| Havens, Fred Z. | Rush, M.D. 1915 | Rochester, Minn. |
| Jordan, Elverse Morris | U. of Texas, M.D. 1923 | Rochester, Minn. |
| Kjelland, Andrew A. | U. of Minn. M.D. 1910 | Hatton, N. D. |
| Leitch, Neil McLean | U. of Ill. M.D. 1925 | Rochester, Minn. |
| Ready, Frank Lane | U. of Neb. M.D. 1925 | 727 E. 18th St., Minneapolis. |
| Ritter, John Franklin | U. of Mich. M.D. 1895 | Maquoketa, Ia. |

### NATIONAL BOARD CERTIFICATE

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| Barker, Nelson Waite | Rush, M.D. 1925 | Rochester, Minn. |
| Iler, Russell Hills | Cornell, M.D. 1924 | Rochester, Minn. |
| Kappes, Louise Osborn | U. of Mich. M.D. 1924 | Rochester, Minn. |
| Nomland, Ruben | Rush, M.D. 1925 | Rochester, Minn. |
| Rentschler, Calvin B. | U. of Pa. M.D. 1924 | Rochester, Minn. |
| Rentschler, Edwin B. | U. of Pa. M.D. 1924 | Rochester, Minn. |
| Dean, Arthur Clark | Jefferson, M.D. 1917 | Crookston, Minn. |

# MINNESOTA MEDICINE

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VOL. IX AUGUST, 1926 No. 8


## EDITORIAL

### The Hospital Interne Year

The general hospital in which the writer has come in contact with hospital internes for the past seven years has had very few interne problems. Consequently the remarks here offered must not be construed as an isolated criticism arising from personal relationships. It is desired to call attention to some situations pertaining to the interne's hospital year which are unfortunate and possibly unavoidable.

No one has all the facts pertaining to the problems involved, but unless we begin to think about them we shall note much delay in their accumulation.

In the first place, while the courses in medicine are somewhat longer than twenty-five years ago, it is doubtful if they are notably more difficult or exhausting. The "pre-medic" preparation is said by some to be too rigid; too intensively scientific—meaning thereby the basic sciences—in a word, not enough humanitarian. Emerson, of Indiana, has elaborated this idea very well. But whether the courses are excessively rigid or not, it has been noted by many that the interne in the hospital year when he should be full of receptivity shows unmistakably that he is "fed up." Like a young and surfeited lion, he is not so much seeking a continuance of the same wisely chosen mental pabulum culled out by those who know full well the proportion and balance he needs, but he craves some blood-red food of his own choice and seeking, and obviously he is attracted to the technique of practical surgery. He is "tired of lectures"—and we may say lecturers. Much that he observes neither meets with his approval nor stimulates his enthusiasm. Yet he is a totally unfinished product and as a rule he knows it full well.

One can sympathize with the interne a great deal and deeply regret that it seems impractical for him to have two or three years of general practice before he enters the hospital for what should prove to him great inspiration through all his years of practice.

Perhaps it is quite too personal a matter even to refer to such a bilogically sound urge as the early marriage even of medical students and internes; quite safer is it perhaps to allude to that universal trend—the acquisition of a motor car. Twenty per cent of some of our recent senior classes at the University are said to have been married; even twenty years ago the ownership of an automobile was said seriously to interfere with scholarship.

Time should be taken with the junior students sometime during the early part of that year to thoroughly impress upon them the portion of their under-graduate education which they are expected to get out of their fifth or interne year. It would seem that this early mention (often repeated) might induce them to adopt an attitude toward the hospital in which they serve, paving the way to an understanding of the responsibilities as well as the opportunities awaiting them.

Perhaps Emerson is right—possibly pre-medical students should have a far wider and looser training along general lines. Then toward the end of their Course and in the hospital they should expect and tolerate very close apprenticeship.

E. L. T.

## Dr. Russell D. Carman

The passing of Dr. Carman has been a tragic loss to his many friends and the profession at large. A leader in his chosen specialty and of international reputation, his contributions to our knowledge of Roentgenology and especially that of the gastrointestinal tract have been most important.

Untimely as his death has been, it was not unexpected either by his more intimate acquaintances or by himself. A number of years ago he had undergone a cholecystotomy and his stomach distress since then had been attributed to this previous trouble. Last fall the diagnosis of an inoperable carcinoma of the stomach was made by Dr. Carman himself and the diagnosis proved only too correct. The nature of the disease was discovered shortly before the meeting of the Interstate Post-graduate Assembly held in Saint Paul in October. Except for a slight loss of weight Dr. Carman at that time appeared in perfect health. As he addressed the meeting few knew what must have been his state of mind. His confessed dread of the development of just such a malady only makes his fortitude in meeting the situation as he did the more admirable. The soldierly manner in which he carried on to the end attending to his work as much as he could only proved the indomitable spirit of the man.

There is a tragic pathos in a situation where one who has devoted such energy to the x-ray diagnosis of stomach maladies should develop an inoperable stomach carcinoma. The limitations of medicine and surgery are only too well illustrated. The possibility of an early detection of the lesion by a periodic health examination has arisen in the minds of some and we are informed that a rule has been made in the clinic in which he worked providing for a complete examination of each physician on his birthday. This procedure should be adopted by every physician in the state.

Genial in disposition and easily approached, Dr. Carman was ever ready to do a favor even for those who had least claim on his time, as the writer can attest from personal experience. The profession of Minnesota and particularly the field of Roentgenology have lost a leader, cut down in his prime and before he had given his full contribution to the world's storehouse of medical knowledge.

## The Health of Young Doctors

We know of no survey ever having been made of the health of undergraduates and internes. Among the internes at a Twin City hospital last year one interne developed pulmonary tuberculosis, one had a gastric hemorrhage due to essential hypertension and one was laid up for months with a generalized infection. This was in addition to a number of instances of infectious diseases among the internes incident to exposure. In another institution the number of internes incapacitated by illnesses was striking. In a medical class of thirty-five members graduated from the University comparatively recently four have died of pulmonary tuberculosis, one other has had a severe pulmonary hemorrhage and two more have had active pulmonary tuberculosis. It is evident that more attention should be paid to the health of undergraduate medical students.

The medical student devotes his time to the study of the cause of disease, its cure and prevention. While admittedly many diseases are beyond the power of the individual to prevent we know that proper attention to the rule of hygienic living will ward off the development of some morbid conditions. As a physician grows older he realizes the necessity for recreation and more particularly the need for mild outdoor exercise. Witness the participation by members of the profession in such activities as golf and hunting. This is an example of practicing what we preach.

The medical course is longer than it used to be and facilities for shortening the actual time spent in undergraduate training by attending school during the summer months may or may not be a step in advance as far as health is concerned. If the medical graduate is prepared to tackle his life work with a physical make up below par it might have been wiser to have interspersed a few more vacations along the way.

The young doctor has to learn that he as well as his patients must obey certain laws of health. It has been said that one does not know how to take care of his health until he has been at some time seriously ill. The extravagance of youth applies also to his unwise expenditure of energy in activities harmful in a physical way.

We believe that an investigation of hygienic conditions among undergraduate medical stu-

dents would bring to light infringements of Nature's laws which if corrected would be to the benefit of those embryo physicians.

## COMMUNICATIONS

To the Editor of Minnesota Medicine:—

The Minnesota Public Health Association wishes to announce that agents of the Children's National Tuberculosis society, who are selling a magazine called "Our Tuberculosis Children," have no connection with the official state or national tuberculosis organizations. Reports received at our office indicate that such claims have been made, and this letter is to inform the public that in making contributions for the magazine, they are not supporting any state tuberculosis work. A telegram from the National Tuberculosis association states that it "cannot indorse, countenance, or approve the Children's National Tuberculosis Society."

E. A. MEYERDING, M.D.,
Executive Secretary,
Minneapolis Public Health Association.
Saint Paul, Minnesota.

### PEKING UNION MEDICAL COLLEGE CARRIES ON

"Peking Union Medical College is a unique item in the program of the Foundation, the only case in which complete responsibility has been assumed for the building, staffing, and temporary maintenance of an institution. But from the outset the Foundation made clear that its purpose was not to create a permanently foreign institution in China, but to transform the College gradually into a Chinese medical center with a Chinese staff and ultimately a Chinese board of trutsees in complete control. It was recognized that this transition would have to be made slowly and carefully, as Chinese doctors and others proved themselves capable of caring for, patients, teaching students, carrying on research, and doing administrative work.

"The results of this policy have begun to show. In 1920, of a teaching staff of thirty-one the Chinese numbered nine, or 20 per cent; in October, 1925, the percentage of Chinese was 53. More significant still is the fact that Chinese doctors now occupy positions of leadership in two departments. One of the two or three most important posts in the entire institution, that of medical superintendent of the Hospital, is efficiently filled by a capable Chinese.

The setting up in coöperation with the College of a health center under local auspices in Peking serves at least two important purposes. It affords a demonstration for the first time in China of a modern health organization with its clinic, records, visiting nurse service, and educational features, and it provides a means of giving medical undergraduates a much needed practical training in the meaning and methods of public health and preventive medicine.—Rockefeller Foundation.

## OBITUARY

DR. RUSSELL D. CARMAN

Russell Daniel Carman, M.D., F.A.C.R., F.A.C.P., died at his home in Rochester, Minnesota, June 18, 1926. He was born in Iroquois, Ontario, March 18, 1875. As a child he accompanied his parents to Butte, Montana, and after a brief stay, to Saint Paul, Minnesota. Attending the public schools in Saint Paul, he later took his premedical studies at the University of Minnesota but took his degree of M.D. at Marion Sims-Beaumont Medical College in St. Louis in 1901. The following year he took postgraduate work in orthopedics at Johns Hopkins and in the summer of 1903 at Harvard.

In 1903 Dr. Carman began practice in St. Louis. A surgeon at first he began devoting his attention to Roentgenology in 1907, becoming Assistant Professor of Roentgenology in 1909 in his alma mater. January 1, 1913, he took charge of the Department of Roentgenology at the Mayo Clinic, in which capacity he remained until his death.

At one time he was Lieutenant in the U. S. Medical Corps. Besides being a member of the Olmsted County Medical Society, Minnesota State Medical Association and American Medical Association, he was a member of the American College of Physicians, American College of Radiology (Past President), Radiological Society of North America (Past President), American Roentgen Ray Society (President-elect), International Congress of Radiology, Roentgen Society of London,

Nordisk Forenning for Medicinsk Radiologi, Alpha Kappa Kappa, Sigma Xi, various Masonic bodies and the Shrine.

Dr. Carman was married in 1904 to Miss Sadie L. Butler of St. Louis, who with his mother, Mrs. J. J. Oliver of Saint Paul, survives him.

### DR. A. C. TAYLOR

Dr. A. C. Taylor, 77 years old, pioneer physician of Duluth, dropped dead at his home Wednesday, April 21, 1926. Death was declared due to apoplexy.

The body was found by W. S. McCormick, city finance commissioner, who said that Doctor Taylor had gone to his garage to get his automobile and was returning to his apartment when he was stricken. He was planning on taking a trip to his summer home with his wife, it was said.

Doctor Taylor was associated in the practice of medicine with his son, Dr. C. W. Taylor, with offices in the New Jersey building. He had been engaged in practice for more than 50 years.

Doctor Taylor came to Duluth from Manchester, Michigan, in 1890, having lived there following the receipt of his degree at the University of Michigan. He was a member of county and state medical societies, and of the American Medical Association.

May 1, 1923, Doctor Taylor celebrated his fiftieth anniversary of professional practice and, at the same time, he celebrated, with Mrs. Taylor, their fiftieth wedding anniversary. They were married at Manchester shortly after Doctor Taylor received his degree.

Doctor Taylor was the local physician for the Duluth & Iron Range railroad and was a staff physician at St. Mary's hospital. During the World war, he was chairman of the advisory board for the local draft boards.

Besides his widow and son Doctor Taylor is survived by a daughter, Mrs. Arthur Hanford, Duluth, and two other sons, Lyman Taylor of Cleveland, Ohio, and Asher Taylor of Brainerd.

### DR. JOHN HALL CROWE

Dr. John Hall Crowe, 58 years of age, pioneer physician of Virginia, and for many years deputy county coroner and poor commissioner, died Saturday, April 4, 1926, at the University hospital, Minneapolis. He had been ill since January 1 and death was caused by intestinal thrombosis.

Born in Peterborough, Ontario, on November 17, 1868, John Hall Crowe came to the United States while yet a young man and completed his medical education at Rush medical college, University of Chicago, in June, 1901.

He took up the practice of medicine in Superior, under Dr. W. E. Ground, of Virginia, remaining there nearly two years. He then came to Virginia where he established his practice.

In 1904, Doctor Crowe was appointed city health officer, holding the post for two years. In 1908 he was reappointed for two years, and again in 1912 he started a four-year term.

Taking an active part in civic and fraternal affairs of the community, Doctor Crowe became a charter member of Virginia lodge No. 264, A. F. and A. M., at its inception in 1906. He was also a member of Virginia Chapter No. 77, Royal Arch Masons, and Eveleth commandery No. 35, Knights Templar, and of Virginia lodge No. 1003, B. P. O. E.

He was master of the Virginia Masonic lodge in 1909 and high priest of the R. A. M. chapter from 1911 to 1912.

Survivors are his window and one brother, residing in Davenport, Iowa.

## REPORTS AND ANNOUNCEMENTS OF SOCIETIES

### NORTHERN MINNESOTA MEDICAL ASSOCIATION

In the June issue of MINNESOTA MEDICINE appeared the program of the Northern Minnesota Medical Association which will hold its annual meeting at Crookston, Minnesota, Monday and Tuesday, August 9 and 10, 1926. The Red River Valley Medical Society will act as hosts and numerous social activities have been planned in addition to an unusually fine scientific program.

The banquet will be held Monday evening, August 9, at which the president, Dr. O. J. Hagen of Moorhead, Dr. Morris Fishbein of Chicago and Dr. Arnold Schwyzer of St. Paul will speak. A dance will follow the banquet.

Tuesday morning clinics in medicine and surgery will be conducted by some well known clinicians of the state.

An extensive didactic program covering the various specialties has been arranged.

The annual dues of $2.50 should be sent to the secretary, Dr. F. J. Hirschboeck, 600 Fidelity Bldg., Duluth, Minn.

### SCOTT-CARVER COUNTY MEDICAL SOCIETY

A change in the date for the annual meeting from December to June was made at the session of the Scott-Carver County Medical Society held June 9, 1926, at Chaska, Minnesota.

Officers elected for the year 1927 are as follows: President, Dr. William F. Maertz, New Prague; vice president, Dr. E. J. Eklund, Norwood; secretary-treasurer, Dr. H. W. Reiter, Shakopee; censor for three years, Dr. C. F. Wohlrabe, Young America; delegate to State Association meeting, Dr. F. J. von Bohland, Belle Plaine; alternate, Dr. H. A. Schneider, Jordan.

Dr. B. H. Simons of Chaska, delegate to the state meeting last May, gave his report. Dr. C. Swanson of Minneapolis addressed the society on "The technic and treatment of diseases and of the commoner difficulties in obstetrics." Dr. Frederick H. K. Schaaf of Minneapolis gave an address on "Diseases of the gallbladder and diseases of the gastro-intestinal tract."

A rising vote of thanks was extended the members

of the Carver County members for the elaborate dinner and excellent entertainment furnished the members of the society.

### WABASHA COUNTY MEDICAL SOCIETY

Dr. J. S. Collins of Wabasha was elected president of the Wabasha County Medical Society at the annual meeting held Thursday, July 8, at Wabasha. Other officers who will serve the coming year are: Vice president, Dr. L. F. Sutton, Mazeppa; secretary-treasurer, Dr. W. F. Wilson, Lake City; delegate to State Association meeting, Dr. W. F. Wilson, Lake City; alternate, Dr. J. A. Slocumb, Plainview; censor for three years, Dr. J. F. Bond, Wabasha.

In nominating Dr. Wilson for re-election to the office of secretary-treasurer, Dr. W. J. Cochrane of Lake City called attention to the fact that Dr. Wilson had been secretary for the past thirty years, stated that he believed he was the oldest in point of service of any component society officer in the state and called for an expression of thanks from the society in his behalf.

The afternoon session was held aboard the Mayo boat the "North Star" which Dr. Mayo had offered for the occasion of the annual meeting. The scientific program included the following papers:

Some Phases of Medical Economics—President's Address—Dr. D. S. Fleischhauer, Wabasha.

Immunization and Serum Treatment: Scarlet Fever and Diphtheria—Dr. W. P. Larson, Minneapolis, and Dr. Woodard Colby, St. Paul.

Relation of the Sanatorium to the General Practitioner—Dr. George McL. Waldie, Buena Vista Sanatorium, Wabasha.

Cod Liver Oil and Other Vitamin Containers in Infant Culture—Dr. J. T. Christison, St. Paul.

Following the boat ride down the river and return a reception for the ladies was given at the home of Dr. and Mrs. D. S. Fleischhauer.

### STEARNS-BENTON MEDICAL SOCIETY

Twenty members of the Stearns-Benton Medical Society were present at the monthly meeting at Foley, June 24. A banquet was tendered by Dr. George Holdrige. The program was as follows:

Heart Arrythmias, Dr. H. B. Clark, St. Cloud.

Case report: Tuberculous Adenitis and Pericarditis in Infants, Dr. W. B. Richards, St. Cloud.

Tumors of the Breast, Dr. F. H. Stangl, St. Cloud. Cloud.

Case report: Ureteral Stricture, Dr. C. F. Brigham, St. Cloud.

Case report: Renal Calculi (in four month infant); Bilateral Pyelitis (in an eight day old infant), Dr. F. J. Schatz, of St. Cloud.

Announcement was made of the death of Dr. George Putney, Paynesville, Minnesota, who died on Tuesday, June 22, 1926. Dr. Putney was the oldest member of the Society.

## OF GENERAL INTEREST

Dr. J. R. Sturre has disposed of his practice at Watkins, Minnesota, and is now located in Minneapolis. Dr. A. Shannon Fourt, formerly of Bonner's Ferry, Idaho, has purchased the Sturre Hospital at Watkins, where he assumed his duties July 1.

The Louisiana State Medical Society at its April meeting adopted a resolution disapproving the replacement of physicians as Health Officers by laymen, who in a comparatively short time has acquired the new title Doctor of Public Health (D.P.H.) The contention is that Health Officers should have the complete training of an M. D.

On June 11, 1926 "The Minnesota Society of Internal Medicine" was organized at a meeting held at The St. Paul Town and Country Club, the charter members consisting of physicians from Minneapolis, St. Paul, Duluth, and Rochester.

The purpose of the Society is "to promote among its members good fellowship, cultivate a distinct type of special practice in medicine, encourage medical education of a high order and stimulate research."

The officers are Dr. Charles Lyman Greene, president; Dr. George Douglas Head, vice-president; and Dr. Edwin L. Gardner, secretary-treasurer.

The first scientific meeting has been called for Rochester early in November 1926.

The death of Dr. Henry Stuhr, chief of staff of St. Barnabas Hospital, Minneapolis, occurred June 6, 1926, when he was killed in an automobile accident on the Jefferson highway south of Osseo, while returning from a call. An obituary notice regarding Dr. Stuhr will appear in the September number of MINNESOTA MEDICINE.

The contracts for a new hospital with a capacity of 200 beds at St. Cloud were let the week of July 19. The general contract of one million dollars was given to The Hutter Construction Company of Fond du Lac, Wisc. Other contracts totalled three hundred thousand dollars. Construction will begin August first and twenty months is allowed for completion. Sisters of St. Benedict are the builders; the architects are Smith, Gardner and Martin, Chicago.

The next examination given by the American Board of Otolaryngology will be held in Denver, Colorado, at the University Hospital on Monday, September 13, 1926. Application should be made to the Secretary, Dr. H. W. Loeb, 1402 South Grand Boulevard, St. Louis, Missouri.

Dr. R. O. Lyday, formerly of the Mayo Clinic, Rochester, is now located in Brevard, North Carolina.

# PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of May 12, 1926

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, May 12, 1926, at 8 p. m.

The meeting was called to order by the President, Dr. H. L. Ulrich. There were 40 members present.

The minutes of the April meeting were read and approved.

DR. CARL B. DRAKE (St. Paul) reported a case of Diaphragmatic Hernia, as follows:

E. C. T., age 48, married, a clergyman, was first seen at 3 p. m. August 15, 1924. At that time he was complaining of an agonizing pain over the entire abdomen most severe in the epigastrium and felt in both shoulders and arms. The pain began after lunch, and vomiting occurred with relief. There had been some stomach distress for three or four days, relieved somewhat two days previous by a dose of Sal Hepatica.

The preceding Fall he had had an attack of severe abdominal pain, fever and jaundice associated with obstinate constipation and he had been laid up several days. Except for typhoid fever in 1899 and influenza in 1921, his past history had been unimportant.

His appetite had usually been good and ordinarily he had no trouble with his bowels. His weight had been about 245 pounds for the past twenty-five years.

The patient was a large individual, evidently in great pain. Temperature 99.8°. Pulse 80. No jaundice. He was acutely tender over the upper abdomen both to the left and right of the mid-line, and pressure over the epigastrium caused pain in both shoulders. A small umbilical hernia was easily reducible. A hypodermic had to be repeated for relief.

Although he felt relieved the following morning, the patient complained of pain on deep respiration and by afternoon his temperature was 102° and he required another hypodermic.

On the third day he was taken to St. Luke's Hospital where his leucocyte count was 25,400; urine sp. gr. 1032, albumen 3 plus, many granular and hyaline casts, no acetone or diacetic acid. Blood pressure 130/88.

Vomiting continued until August 23rd, the vomitus at times being dark brown and bitter, but never fecal in odor. The stomach was washed this date and fluoroscopy showed a normally located cardia, a filling defect at the prepyloric area and a barium shadow high in the duodenal region at a higher level than the fundus. My impression was that a gastric ulcer had perforated.

By August 28th the leucocytosis had gone down to 15,000, the urine had returned to normal and the fever had been in the vicinity of 100° for several days. This date a laparotomy was performed by Dr. Harry P. Ritchie.

Upon opening the abdomen the omentum was found extensively adherent to the structures in the upper abdomen. The adhesions were separated but search failed to show any sign of stomach or duodenum.

Reaching in to the region of the fundus, the stomach could not be identified. A large, distended, thickened gallbladder, surrounded by adherent omentum was removed. Convalescence was uneventful except for a slight elevation of temperature.

A later fluoroscopy by Dr. E. Schons showed the actual state of affairs. Upon drinking the barium, the cardia was seen to fill in its normal position below the left diaphragm and the fluid was distinctly seen to return above the level of the diaphragm between the heart and spinal column in the mid-line. The antrum of the stomach, pylorus, and descending duodenum were herniated apparently through the esophageal opening.

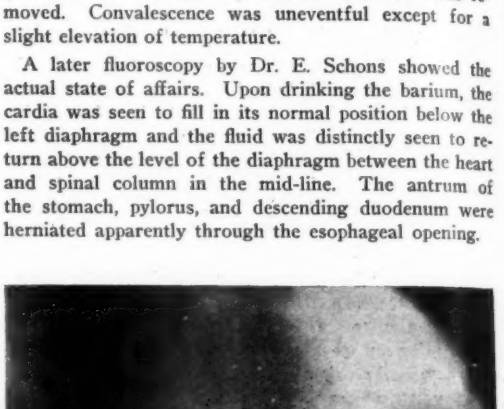

Illustration showing filled cardia on the reader's right, heart in the center, and filled prepyloric area to the left of the heart and above the diaphragm.

The accompanying illustration is an *X*-ray taken in the diagonal position and shows the heart shadow in the center, the filled cardia to the left and the antrum to the right of the heart. Faint streaks of barium show the position of the stomach lying in the esophageal opening and the filled duodenum is visible returning through the opening in the diaphragm.

The question of attempting further operative procedure arose. It was felt that the hernia was probably congenital and the relation of the undoubted gallbladder involvement to the anomaly was uncertain. It was decided to postpone further operative procedure.

If the acute abdominal attack, as manifest by the toxic symptoms of fever, albumen and casts, was entirely of gallbladder origin, cholecystectomy would doubtless prevent furthur attacks. If due to a strangulation of the stomach and duodenum, which was spontaneously relieved, recurrence would be likely.

The patient left for his home in Arkansas a short time after recovery from the operation. A recent communication from him states that about six months later he "nearly died of an attack of intestinal flu which seemed partially to paralyze the stomach and intestines." He continued to be troubled with gas on the stomach, which clabbered milk and buttermilk relieved. He has

lived largely on this diet since last December until recently he has been able to eat almost anything but potatoes.

Diaphragmatic hernia has been much more frequently diagnosed and reported since the advent of the x-ray. In 1923, Coley states that Griffin had collected 650 reported cases, only 15 of which had been diagnosed before operation or autopsy. Knoggs reported 63 cases of hernia of the stomach, 23 of which were congenital, 21 traumatic and 12 acquired, the acquired ones being through esophageal opening. Wilkes drew attention to the existence of excessive thirst in cases of stangulation of the stomach.

Non-traumatic hernias of the diaphragm probably depend on acute or chronic increase of intra-abdominal pressure. According to Abbott, they occur through one of the so-called preformed openings of the diaphragm which are:

"1. The esophageal foramen.

"2. The foramen of Morgagni at the junction of the sternum and the seventh costal cartilage on either side.

"3. The foramen of Bochdolek posteriorly between the lumbar and costal divisions of the diaphragm.

"4. The point of entrance for the sympathetic nerve, between the external and median crura."

These hernias are much more common on the left side, and hernia through the esophageal opening is much the most common. No case of hernia through the orifices of the aorta or vena cava has been reported, according to Abbott.

Abbott believes that small hernias at the esophageal opening are more common than generally recognized. Some such cause few symptoms. Others produce epigastric pain, acid eructation of stomach contents and vomiting. They may be easily overlooked in routine x-ray stomach examinations in the erect posture. These slight hernias may be demonstrated by the patient straining in the horizontal position, being viewed in the oblique position under the fluoroscope.

The case here reported may have been acquired, the overweight having caused excessive strain on a congenitally weak esophageal opening in the diaphragm. The presence of an umbilical hernia suggests the likelihood also of a weak esophageal opening. The gallbladder thickening and omental adhesions might well have been secondary to diaphragmatic strangulation. The shoulder pain, aggravated by abdominal pressure, is a good example of referred pain through phrenic nerve irritation. The recurrence of an attack since operation, similar to the one observed, indicates that what we observed was a strangulation of the stomach and operative relief will in all probability have to be resorted to.

DISCUSSION

DR. ZIMMERMAN (St. Paul): A little over a year ago I took care of a case similar to the one reported by Dr. Drake. This patient, too, had also been operated upon for a gallbladder and the gallbladder removed. In spite of this operation he suffered frequent attacks of pain in the epigastrium. This pain would be relieved by taking alkalies to a slight extent. He had some of the characteristics of peptic ulcer. The x-ray revealed a picture almost identical with the picture here exhibited by Dr. Drake. The stomach was drawn up above the diaphragm into the posterior mediastinum. The bismuth meal would leave the esophagus and would turn into the posterior mediastinum and then gradually come out into the duodenum through an opening apparently in the diaphragm. A diagnosis was made of diaphragmatic hernia through the esophageal opening.

A laparotomy was made. It was found impossible to reduce the hernia and if it were possible to reduce it, it seemed impossible to close the opening. There was quite a pouch of stomach that had not herniated and to this pouch I made a posterior gastroenterostomy. This was a year ago and the man has been thoroughly comfortable ever since. I am unable to say whether his relief is due to the short circuiting of the portion of his stomach and duodenum contained in the hernial sac or whether the man actually had a duodenal ulcer in that part of his duodenum that could not be seen, and this was relieved by gastroenterostomy. In any event, he is comfortable at the end of a year.

DR. STRACHAUER (Minneapolis): I have operated upon two cases of diaphragmatic hernia, one of the congenital type and the other of traumatic origin. In the second case the entire stomach, about six feet of intestine and a large quantity of omentum had herniated through the ruptured diaphragm into the thorax. Both cases were operated upon through the abdominal approach. The hernial contents were reduced, and the opening in the diaphragm closed without difficulty and really with comparative ease. The diagnosis in these cases, however, was not readily arrived at. The traumatic case followed an automobile accident, and had been x-rayed, carefully studied and treated elsewhere with a diagnosis of hemothorax. The patient's condition gradually improved, she was up and about and enjoyed a fair degree of health for a number of months. She later developed acute attacks of pain and smothering in the chest, which were considered to be cardiac in character. Auscultation of the chest, however, disclosed bubbling sounds. A gastrointestinal study showed the stomach and bowels above the diaphragm, and a correct diagnosis was finally made.

DR. MANN (Minneapolis): These cases all illustrate the fact that the diagnosis is most important. The main point in these cases, in fact, is the diagnosis. In the past, before the war, very few of these cases were diagnosed. Most of the cases were found in the routine of an autopsy and were not suspected before death; a few were discovered during an operation for some other condition; some of them have been discovered accidentally in an x-ray of the chest for some other supposed condition; occasionally a diagnosis has been made because a gurgling sound has been heard on a careful examination of the chest, such as could come from no other organ than the bowel or the stomach.

There were so many traumatic hernias of the diaphragm during the war and the x-rays showed them so definitely that the x-ray has been used more and more extensively in obscure cases involving the chest, or in cases in which a diaphragmatic hernia might pos-

sibly be suspected, that more and more cases have been discovered in civilian practice. Gurgling in the chest and the x-ray, with the bowel containing the barium mixture showing in the chest, are both practically positive for a diagnosis.

But I wish to remind you that if gurgling is not heard, or if, in the examination of our patients, something does not attract our attention to the possibility of a diaphragmatic hernia or something abnormal in the chest so that we employ the x-ray, then we are no better off for diagnosis than they were forty years ago and the diagnosis will be missed.

As to symptoms, they vary from nothing at all to very severe ones, depending on the organs involved and the ways in which they are involved. They may vary, as to the intestinal, from mild to the more severe grade, and, as to the stomach, from mild to the more severe. There may be tachycardia from pressure on the heart. If the examination of the chest detects gurgling, your diagnosis is almost made. So, even without the x-ray, you can almost make a diagnosis if you can hear gurgling. The diagnosis with the x-ray, if propertly used, is almost absolutely sure.

As to the surgical operation, some of these cases without adhesions are not very difficult but those with adhesions of the organs in the chest or in the posterior mediastinum are exceedingly difficult, as those of us who have had such cases to deal with know full well.

Dr. Ulrich (Minneapolis): I would like to make a point regarding Dr. Drake's case and the toxemia. He thinks toxemia is due to nephritis. That may have been due to the acute obstructive symptoms of the higher portion of the bowel. Rowntree has called attention to the acute obstructive syndrome with findings in the urine resembling nephritis. If a blood chemistry had been done you might find the chlorides reduced and the urea nitrogen high. Blood tests should be done on Dr. Drake's case the next time he presents himself with acute symptoms. We recently had a case at the General Hospital of right-sided diaphragmatic hernia. The colon was involved in this case. The bowel was replaced and the hernia reduced by operating through the thorax. Gradual collapse of the lung was induced by pneumothorax and then the patient was successfully operated on through this cavity.

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Dr. Chas. W. More (Eveleth) reported a case of Fracture of the Spine.

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Dr. Donald C. Balfour (Rochester) read his Thesis, entitled "The Management of Peptic Ulcer."

DISCUSSION

Dr. Strachauer (Minneapolis): This is too important a paper to pass by without discussion.

It is not alone that the clinical results following the excision of gastric ulcers have been greatly improved but the importance of obtaining the lesion for microscopic examination should be emphasized. In ulcers one centimetre in diameter or larger, it is absolutely impossible to grossly ascertain the presence of benignancy or malignancy without microscopic examination. These cases should be handled like questionable tumors of the breast. Microscopic examination of the frozen section should be made immediately, and, of course, when malignancy is present a suitable type of partial gastrectomy immediately performed. It is in these cases requiring a microscopic examination for diagnosis that we are to achieve improved results in the surgery of malignancy of the stomach.

I have had cases of ulcer in children, one of the stomach in a child 11 years old, and the other of the duodeum in a child of 13, in both of which simple excision without gastroenterostomy gave entirely satisfactory results. I should be interested to learn what Dr. Balfour's experience has been in the treatment of ulcer in children.

In endeavoring to solve the problem of ulcer by operation, the surgeons have had their "fling" and periods of enthusiasm for first one operation and then another. All this has been productive of good, for as a result we have at our disposal a number of operations having definite limitations and special indications. The surgical treatment of ulcer has become one of the most satisfactory special fields in our practice. The anatomical location of the ulcer, its attachment or penetration into neighboring structures, the presence or absence of pyloric obstruction, the degree of gastric acidity, the presence of bleeding, and the phase of the ulcer—whether active or inactive—are all factors of the greatest importance and must be taken into consideration in determining the type of procedure indicated in the special case at hand.

Dr. Zimmerman (St. Paul): I am very glad to hear Dr. Balfour defend gastroenterostomy and the more conservative surgical treatment of duodenal ulcer. It is most distressing to see the tendency to do wide and mutilating operations on the stomach for apparently quite small lesions.

Dr. G. Schwyzer (Minneapolis): It is very gratifying to hear Dr. Balfour's paper this evening. The subject is so large that one does not know where to start. It occurred to me to mention a case I had years ago. The patient was first operated upon for appendicitis. A year later I diagnosed a subdiaphragmatic abscess which I successfully drained. The man was complaining considerably two years later, when I made a gastroenterostomy without any complications. The patient left the hospital a week later. After five years he came in a very desperate condition and presented a complicating peptic ulcer. He had a perforation in his stomach, a hole between the stomach, the large intestine and the small intestine. There was quite a mass to find the way through. The patient died.

I have had quite a number of perforations of peptic ulcers, especially duodenal ulcers. I discharged one of them only last week. The question of importance is: Should we do a gastroenterostomy or not, or possibly a gastrectomy? That depends on circumstances and the condition of the patient. If operation is done early enough and the condition of the patient is fair, I would think a gastroenterostomy was indicated in such a case.

I have had seven perforating ulcers, with good results. Everyone of them is living today.

A question which I would like to bring out, which is really more interesting to the internist, occurred to me through the reading of the European literature; and that is whether we treat these cases, after gastroenterostomy or gastrectomy correctly. There is a Russian, Jarotiski, Professor of Internal Medicine at the University of Moscow, who brought out the fact that the treatment of these cases is mostly incorrect. Basing his study upon physiology, he brought out the fact that any kind of diet for the ulcer which does not overcome the hyperacidity is incorrect. He condemns milk. He claims that milk has a quality of remaining too long in the stomach—when a part of the milk is given up to the duodenum, the pylorus shuts off immediately and a good deal of the milk remains in the stomach. He claims that after he had brought the acidity of the stomach to normal, all he would have to do to bring on the hyperacidity again was to give the patient more milk. His diet consists of albumen from the white of egg and non-salted butter. He claims to be able to control pains from ulcers very promptly by the mentioned diet. The first day he gives the white of one egg in the morning and in the afternoon 20 cc. of saltless butter and increases that to ten eggs a day plus 160 to 180 grams of saltless butter.

He claims if that course was followed by the surgeon after these operations, we would have better results.

DR. H. NIPPERT (St. Paul): I would like to ask Dr. Balfour what is the percentage of malignancy following duodenal ulcer?

DR BALFOUR (in closing): Concerning the occurrence and treatment of peptic ulcer in children, duodenal ulcer does occur in children and is often the hemorrhagic type so that in such cases there would be a preference for a local excision of the ulcer and a pholoroplasty.

As to how much of the stomach should be removed to create an achlorhydria, I prefer to do a rather limited resection; and in examining the gastric contents of a number that I had done recently I found that achlorhydria was present in all of them.

In regard to malignancy in duodenal ulcer, it is commonly supposed that this never develops in a duodenal ulcer, but instances of malignant degeneration have been reported. We believe, however, that malignancy in duodenal ulcer is very rare.

I conclusion, I think we ought to keep clearly in mind, in the management of these cases, first, the difference between gastric and duodenal ulcer. In duodenal ulcer many patients get well by doing nothing. Certainly if I had duodenal ulcer I would try and get well with non-surgical treatment. If I couldn't get well with medical treatment, I would have the most simple operation that could be performed. The most simple one is gastroenterostomy. If I did not get well on that I would have a radical operation. Most clinics report 2 per cent gastrojejunal ulcer.

As regards the after-care which Dr. Schwyzer so interestingly spoke about; it can be overdone both ways. It can be overdone by telling patients they can do anything they please. In those patients who have a great tendency to recurrence, I think you will often find there are certain things they are doing which they should not do. One of the most important points concerns smoking, and this is illustrated by the fact that when Boas has had a patient referred to him for peptic ulcer, he looks for cigarette stains on his hands and if he finds such stains he refuses to treat him.

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DR. J. G. CROSS (Minneapolis) read a paper entitled "The His Bundle and Its Disturbances."

DISCUSSION

DR. FAHR (Minneapolis): The whole history of the discovery and physiological investigation of the His system has rolled before my eyes in my own short medical career. His gave his first complete description in 1904, just before I entered Medical School. Then in 1906, Retzer had just come back from His' laboratory where he had made the first histological study of the bundle and he became my teacher in anatomy. Hering had just cut through the bundle and found that if he cut it entirely in two he got complete block. The first problem I was given to work on when I was a student at Johns Hopkins was the investigation of the nerve supply to the bundle. In 1906 Tawara made the classical investigation of the whole system from the A-V node out into the finer arborizations of the system in the subendocardial layers of both ventricles. From 1904 to 1907 the fundamental investigative work was done. With the exception of certain of the problems of etiology, the chapter is almost a closed one on anatomy and physiology; perhaps etiology is the one part not yet satisfactorily worked out.

Probably the majority of cases of temporary heart block follow rheumatic fever and other acute fevers and the more permanent cases are found associated with coronary sclerosis. And then of course there are these cases following infection which Dr. Cross described, where we don't know just what happened. Oppenheimer is probably correct in saying that the majority of permanent blocks are mostly all due to coronary disease.

We thought the opening up of this field would open an important contribution to medicine. We had this large group of hearts with no rheumatic fever and no infectious etiology, called myocarditis, and they died of heart failure. Explaining it on the pathological findings is not always satisfactory. Disturbance of conduction were thought to be of great importance for the work of the heart and might explain cases of heart failure not explained by the slight pathological findings.

Heart block apparently becomes a deleterious factor for the work of the heart only when it results in a 2:1 block; that is, reduces the ventricular rate below 50-60. Beyond that point there is about a 40 percent reduction in the work of the heart, according to Eyster's investigations. Up to that point it does not make very much difference. The arrhythmias which do interfere with the work of the heart are fibrillation, flutter, paroxysmal tachycardia, and frequent extrasystoles.

I am surprised that the men who are practicing outside of the large city hospitals see so many of these cases. Just recently I have been going to the City & County Hospital to look for heart block for teaching purposes. In two visits to the City & County Hospital, one visit to the General Hospital, and frequent visits to the University Hospital, I have only seen one case of complete heart block with Adams-Stokes' syndrome. In my experience, heart block is not common, and Adams-Stokes disease is very rare.

Dr. Gilfillan (St. Paul): These cases of course are of very great interest, and especially the pathology of them. I think during life the pathology is problematical. If we find a luetic we think it may be a gumma of the septum. I have seen some hearts with carcinoma. We do see it, however, when it is difficult to tell what the pathology is. Unfortunately these cases have a way of becoming very dear to their friends after death and I have not had many postmortems on them.

The cases I speak of especially are young people. I have a young man under observation, with ordinary slight infections, who developed a block which has kept on and on for years. This man I saw first six years ago with typical Stokes-Adams'. What is the cause in that man? What is the cause in these cases where we cannot demonstrate arteriosclerosis? We can, of course, say that one of the infections through which they have passed has caused degeneration of the septum involving the bundle, and the condition arose from that. I wonder if that is so; but I never saw one. These cases in younger people where there is no syphilis and the etiology is doubtful, I have always wondered what the etiology really was.

It does not take much to produce heart block; that is, it can be produced without any visible lesion in the bundle. Most of these cases of block are not complete all the time. The young man I spoke of would have 50 or 60 attacks a day, with a pulse of 20 or 30, and he would come out of it. The bundle has never been completely severed. It is a play between partial block and complete block; a 2 or 3 : 1 rhythm, and the coming of a complete block and the development of the Stokes-Adams' syndrome.

These cases are more common than we think because they are apt to be mistaken for something else. I remember before the days of electrocardiograph, there was a patient in the hospital and the doctor said that old man had epilepsy. His pulse was 26. I told them to take him over to my ward as I wanted to study him, and I watched him in many attacks. I got a postmortem of the heart, sent it to the University and they promptly lost it.

I recall a case I saw sometime ago. The doctor in charge called me in consultation; he thought the patient had brain tumor and slow pulse. It probably is not as uncommon as some think.

The working out of the system has come mostly in Dr. Fahr's time, but not all. We had the Purkinje fibres when I went to school.

Dr. Ulrich (Minneapolis): As to the finding of block, I think we do see more of this in private practice than in the hospitals. The terrifying and horrible part of this disease is the tendency to asystoles. It is this tendency which produces Stokes-Adams syndrome. How can we prevent asystoles in these cases? Many drugs have been used: atropin, adrealin, digitalis, amylnitrite. Recently Cohen and Levine have called attention to three cases in which they used barium chloride. From animal experimentation they have learned that calcium and barium increases the irritability of the ventricle. In their three cases they were successful with barium. We recently had a case where the ventricular rate was 18 to 26 and the auricular 54. We kept that man alive with barium chloride for three weeks, and then he failed us.

In this connection recently there has been a contribution which relates to the extrinsic nerves of the heart. In the current number of the *Journal of Clinical Investigation* (February) DeGraff and Weiss have taken 8 cases of heart block at Bellevue Hospital, testing out the action of drugs on the extrinsic nerves of the auricles and the ventricles. They have shown that there is practically no vagus control of the ventricle, and that there is richer sympathetic supply to the ventricles than the auricles. Atropinization of the vagus has the same effect on the auricular rate in heart block as it has in a normal heart. It does not affect the rate of the ventricle in the heart block. They have also tried digitalis without any perceptible change of the rates of the ventricles. Adrenalin had a distinct increase on the ventricular rate, and this was more evident after the atropinization of the vagus. In our case adrenalin and barium seemed most successful in preventing asystoles.

Dr. Gilfillan (St. Paul): The case I spoke of has had barium and went without asystoles for a considerable time.

Dr. Cross (in closing): There is very little that I care to add in discussion. As I mentioned before, it early became evident to me that a discussion of the subject of the His bundle must remain incomplete without clinical data and illustrations. I hope to add these at a future time.

The meeting adjourned.

John E. Hynes, M.D.
Secretary.

# CASE REPORTS

Members are requested to report interesting and unusual cases for publication in this department. Many cases reported at hospital staff meetings and similar meetings are very instructive and worthy of publication.

## ROENTGEN DIAGNOSIS OF LEFT SIDED APPENDICITIS*

LEO G. RIGLER, M.D., and D. W. POLLARD, M.D.
*Minneapolis*

The clinical diagnosis of left sided appendicitis is made occasionally but usually with much hesitancy. The roentgenologic demonstration of the cecum on the left side in such a case is so convincing that the diagnosis is thus made certain. The following case report illustrates well the aid offered by the roentgen examination under such circumstances.

Fig. 1. Roentgenogram following barium enema. The rotation and transverse position of the ascending colon and the position of the cecum in the left upper quadrant are well shown. The contact between the cecum and descending colon and the ragged edge of the cecum should be noted.

N. J., aged 41, was admitted to the Minneapolis General Hospital complaining of severe pain on the left side. The illness had begun two nights previously with sharp pain in the left portion of the abdomen which awakened the patient. The pain was of a cutting nature and did not radiate, the point of greatest intensity being in the mid-clavicular line at the level of the umbilicus. The pain continued for 36 hours, then abated somewhat. On admission there was a constant dull ache.

There had been a similar attack about three years previously. Otherwise there was nothing of any significance in the past or present history.

The position of greatest comfort was lying on the left side with the knees drawn up. The rectal temperature was 101 F., the pulse 100. Physical examination was negative except for the abdomen. There was extreme tenderness and rigidity over the entire left side. The point of greatest tenderness was at the level of the umbilicus in the mid-clavicular line. A rather soft, immobile mass, 10 cm. in diameter was palpated. Evidence of peritoneal irritation was obtained.

The leucocyte count was 11,300. Otherwise the laboratory findings were negative.

The clinical diagnoses considered were: (1) Left-sided appendicitis; (2) renal colic; (3) intestinal obstruction; (4) diverticulitis.

A barium clystra was given under fluoroscopic control. The descending colon filled with difficulty and showed an unusual kinking in its upper portion at about the point of pain. The transverse colon was normal. The hepatic flexure was rotated so that the ascending colon was directed transversely across the abdomen, the cecum being located in the left upper quadrant in close contact with the loop in the descending colon. The cecum could not be separated from the descending colon and the point of greatest tenderness was just at the contact with the descending colon. The base of the cecum was ragged and the appendix could not be filled. The appearance suggested an appendiceal abscess with adhesions between the cecum and descending colon. The findings are shown in Figure 1.

The patient began to improve and refused operation. He was treated in another institution without surgery and at this time appears to have recovered from the acute attack.

Although not confirmed by operation, the clinical and roentgenologic findings were so characteristic that there appears to be little doubt as to the diagnosis of left-sided appendicitis.

*From the Department of Roentgenology and the Surgical "B" service of Drs. Moren and Maxeiner of the Minneapolis General Hospital.

## TORSION OF THE PEDICLE OF A DERMOID CYST*

REPORT OF A CASE

MARTIN S. SICHEL, M.D.
*Minneapolis*

E. M., aged 30, female, unmarried, entered the Minneapolis General Hospital on April 17, 1926, complaining of pain in the left lower quadrant of the abdomen and inability to void for eighteen hours.

Her past history was negative except for an appendectomy in 1921. She had never been pregnant, her menstrual periods being regular and the last period being on March 20th. She had missed no periods. The

*From the gynecological service, Minneapolis General Hospital, Minneapolis.

general physical examination was essentially negative except for the local abdominal and pelvic findings. There was colostrum in both breasts but no pigmentation.

On admittance a tumor was felt extending to two fingers above the umbilicus. The patient was catheterized obtaining 1200 c.c. of urine which was normal on examination. The abdominal tumor dropped to two fingers below the umbilicus. A pelvic examination was made and a diagnosis of four and one-half months pregnancy made. Her pulse and temperature were normal and leukocytes showed 14,800 count with 83 per cent polymorphonuclears on admittance.

She was observed for one week during which time she passed her urine spontaneously and normally. Toward the end of the week a temperature of 99.6° would develop daily and the patient constantly complained of pain in the left lower abdominal quadrant. At this time a mass distinct from the larger mass was outlined in the left lower quadrant which was firm, tender and about the size of an orange. A tentative diagnosis ot torsion of the pedicle of an ovarian cyst complicating pregnancy was made and it was decided to operate.

At the operation two ovarian cysts were found, the one on the right being the size of a baby's head and the one on the left the size of an orange. The large right cyst was a dermoid containing a large amount of sebaceous material and hair. The one on the left was necrotic, firm and hemorrhagic and there were two complete twists of the pedicle. The pedicle was unwound and the cyst removed. This was also a dermoid containing three teeth of adult size, sebaceous material and hair. The uterus at the time of operation was normal in size and showed no signs of being in the pregnant state. A small portion of the right ovary near the base of the pedicle was left in situ and both tubes were removed.

The patient made an uneventful recovery being discharged at the end of a fourteen day post-operative course. She menstruated normally on the third day following operation.

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We may conclude from this study that the life expectancy of college graduates is somewhat higher or more favorable than that of the average young man accepted for life insurance. So far as the group of figures are reliable, for the age groups concerned, there is no evidence to indicate injuries to the health of students by athletic sports conducted under such supervision as is enforced at Yale. It would appear that men of the type who make athletic leaders are likely to expose themselves, both in war and peace, to excesses of physical injury which are escaped by their less active associates. Because of the limited numbers at the older age periods where degenerative diseases are more common, it is now proposed to continue this study to include graduates prior to 1905. (J. C. Greenway, M.D. *Yale Alumni Weekly*, June 11, 1926.)

# PROGRESS

Abstracts to be submitted to Section Supervisors.

Members are urged to abstract valuable articles which they run across in their reading and send the abstracts to the physicians in charge of the respective sections. In order to avoid duplication it would be well to communicate with one of the section supervisors before the article is abstracted.

## MEDICINE

SUPERVISORS:
F. J. HIRSCHBOECK,
FIDELITY BLDG., DULUTH

THOMAS A. PEPPARD,
LA SALLE BLDG., MINNEAPOLIS

BLOOD PRESSURE IN WOMEN AS INFLUENCED BY THE SEXUAL ORGANS: Alvarez and Zimmerman (Archives of Int. Med. May 1926). Obesity seems to influence blood pressure in women. Well proportioned women have systolic pressures that average 10 millimeters higher than those of the thin, and the stout average 12 millimeters higher than the well proportioned.

The masculine distribution of hair, sexual anesthesia, fibroids in the uterus, thyroid disease, and pelvic conditions requiring ovarectomy or hysterectomy, are associated with high average pressures. Sexually abnormal women have higher pressures than women who are sexually normal. Marked hypertension in girls sexually normal, was associated with severe nephritis.

The writers believe that essential hypertension is a bodily peculiarity inherited equally by girls and boys, but ordinarily repressed in women before the menopause or the ovarian or other related secretions. When the pelvic organs are subnormal, the disease may appear in women as early as it does in men.

F. J. HIRSCHBOECK, M.D.

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CORRELATION OF CLINICAL AND LABORATORY PROCEDURES IN TUBERCULOSIS. THE COMPLEMENT FIXATION TEST: Alexander Josewich and Floyd Grave, M.D. (U. S. Veterans' Bureau, Medical Bulletin, 1926, II, 346). The authors report the use of complement fixation tests in 750 cases at the U. S. Veterans' Bureau Hospital at Minneapolis, Minnesota. Petroff's antigen was used.

Seventy six per cent of 123 positive sputum cases gave positive fixation. Excluding nineteen cases of poor resistance there were left 104 cases of which 90 per cent gave positive fixation. Of the 270 cases giving positive complement fixation 93 per cent were positive clinically. Of 242 cases giving negative complement fixation 95.5 per cent were negative clinically. In cases in which a definite and final diagnosis of inactive pulmonary tuberculosis was given, the positive and nega-

tive fixations were quite evenly divided; the test is more apt to be negative in the event of pulmonary fibrosis. The test was more apt to be positive in the early and moderately advanced cases than in the far advanced cases with definitely poor resistance. The authors report thirty seven positive Wassermann tests in tuberculous patients with the use of the Kolmer test. Twenty three of these were negative to the tuberculosis complement fixation tests. All were clinically positive for syphilis. The cases giving both tests were fourteen in number and all but one were clinically positive for tuberculosis. Twenty seven cases diagnosed as extra-pulmonary tuberculosis were tested by the complement fixation test. Two thirds gave positive fixations which would suggest that the test is less satisfactory in extra-pulmonary cases. However, not all of the diagnoses were determined by biopsy. The authors conclude that the test should be employed as a routine procedure where a considerable number of patients are being studied and good laboratory service is available. It is usually negative in those who are acutely ill or in the terminal stage of the disease and may be negative when the disease is arrested. It is not an indicator of prognosis nor of the probable duration of the disease. Continued efforts should be made to standardize technique

A. T. LAIRD, M.D.

THE CLINICAL ASPECTS OF BUNDLE BRANCH BLOCK: Cowan and Bramwell (Quarterly-Journal of Medicine, Oct. 1925). This report is based on a study of twenty-four cases. Fourteen have died (ten within one year) and three others within eighteen months from the time they came under observation. Seven died of progressive heart failure with congestion, two of acute heart attacks, five from causes not directly connected with the heart. Ten patients are alive at the present time, seven are enjoying quite good health, but in only one case has there been any evidence that the lesion is tending to clear up. Twenty were men; four were women. Twenty were between 40 and 70 years of age.

The most common symptoms were shortness of breath in thirteen cases; there was anginal pain in eight; cardiac enlargement in fourteen; hypertension in eleven; associated valvular disease in eleven; auricular fibrillation in five; complete auricular ventricular block in one case.

The condition appears to be due to a secondary fibrosis of the heart muscles. Only one case showed involvement of the left branch of the coronary, showing a rather striking immunity. This was explained on an anatomical disposition and a richer blood supply.

The writers believe that it is a sign of definite myocardial disease, but if unaccompanied by signs of cardiac insufficiency is not necessarily of grave significance.

F. J. HIRSCHBOECK, M.D.

A CAUSE OF ESSENTIAL HYPOTENSION: A. E. Fossier (Am. Jour. Med. Sc., April 1926). Fossier, of New Orleans, writes an interesting article on the cause of essential hypotension.

He states that all hypotheses heretofore advanced as to the etiology of essential hypotension have been either unproved, refuted, or found to be impracticable.

It is a condition usually found in the asthenics or splanchnoptotic, and it may be relieved by the treatment of the splanchnoptosis with abdominal support, the strengthening of the abdominal muscles and increasing the intra-abdominal fat. Organotherapy has been of no value.

It is met with in cases having an elongation of the ascending aorta and narrowing of its hemicircle, and the heart poorly supported by the diaphragm. It answers the hydraulic principles: the longer the pipe and the smaller the radius of the bend, the smaller will be the final velocity energy; or, in men, the longer the ascending aorta, the narrower the diameter of the aortic arch, the heart pressure being equal, the lower the systolic blood pressure.

This article is particularly timely and interesting.

F. J. HIRSCHBOECK, M.D.

## SURGERY

SUPERVISORS:
DONALD K. BACON,
LOWRY BLDG., ST. PAUL
VERNE C. HUNT,
MAYO CLINIC, ROCHESTER

TECHNIC OF USE OF REMOVABLE RADON SEEDS IN CARCINOMA OF THE TONGUE: Joseph Muir (Annals of Surgery, Philadelphia, May 1926, Vol. lxxxiii, p. 598). This article describes a new technique of radium therapy in lingual carcinoma which offers a practical means of irradiating even the most inaccessible tongue lesions. This is accomplished by the implantation of removable platinum radon seeds. As the methods of treatment heretofore used have always proved unsatisfactory, this article is of especial importance from a clinical standpoint.

The various methods by which lingual carcinoma has previously been treated are discussed and their advantages and drawbacks considered. Imbedding of bare tubes according to Janeway's method affords an even distribution of radiation, but causes necrosis which is invariably followed by sloughing and may even induce unavoidable fatal hemorrhage. If screened seeds are used, necrosis is avoided, but they are objectionable because they must remain in the tongue as foreign bodies. The platinum needles advocated by Regaud also obviate necrosis and can be removed when radiation has been accomplished, but proper distribution of these applicators is very difficult; they cause too much trauma; and above all, they are hard to immobilize and cannot be placed upon the posterior dorsal surface of the tongue.

The method offered in this article obviates all these difficulties, while retaining every desirable feature. The seeds are completely screened with platinum, thus doing away with necrosis and sloughing; they are easily

withdrawn after adequate dosage has been delivered, so that they do not remain in the tissue as foreign bodies. These seeds can be placed in any position required, just as readily in the hitherto inaccessible "root" of the tongue, as in more favorable positions. The article is profusely illustrated, demonstrating the exact method of approach to these inaccessible lesions.

The growth is first carefully palpated, and the number of seeds required determined according to its depth and surface extent. When a seed has been placed in the desired position, the attached thread is left protruding from the point of entry, where it is cut off so as to leave just enough to be readily grasped with forceps at the time of removal.

The entire treatment causes no pain, and but slight inconvenience to the patient; and when skilfully performed under proper aseptic precautions, the technique offers an excellent means of solving one of the most vexing of clinical problems.

## GYNECOLOGY AND OBSTETRICS

SUPERVISORS:
ARCHIBALD L. McDONALD,
LYCEUM BLDG., DULUTH

L. W. BARRY,
LOWRY BLDG., ST. PAUL

OUTLET PELVIMETRY AND ITS IMPORTANCE: C. O. McCormick (American Jol. Obstetrics and Gynecology. Vol. XI. No. 6). The author describes and illustrates the various methods of measuring the pelvic outlet. He considers the bis-ischial and posterior sagital diameters as the most important. The bis-ischial diameter extends across the anterior border of the anus and is fairly easy to measure with simple apparatus. The posterior sagital diameter is more difficult but the author describes several methods. He prefers an outlet pelvimeter described by Geo. H. Pierce.

He does not consider Roentgen ray pelvimetry of much practical value especially as regards the outlet. Outlet pelvimetry is necessary to demonstrate some of the most common types of contracted pelvis, namely the "Funnel pelvis" which represents 44 per cent of contracted pelves in white women. Without measurements, this type of deformity is usually missed till late in labor, and is the most frequent cause of outlet difficulty. It is often noted in women of muscular type with unusually large inlet measurements, and who are likely to produce stocky overweight babies.

He regards a bis-ischial transverse diameter of 8 c.m. or less as evidence of outlet contraction which indicates a narrow pelvic angle of the pubic rami instead of the usual one of 70 to 100 degrees. This forces the fetal head backwards throwing the pressure on the posterior triangle of the outlet; the perineum, levators, and pelvic fascia. If the bis-ischial diameter is less than 8 c.m., it is important to measure the posterior sagital diameter. With a narrow transverse diameter one may find compensatory increase in the posterior sagital. He quotes from Williams the requirements which are necessary to provide adequate space at the outlet.

A transv. diameter of 8 c.m. requires a post. sagital of 7.5 c.m.
A transv. diameter of 7 c.m. requires a post. sagital of 8 c. m.
A transv. diameter of 6.5 requires a post. sagital of 8.5
A transv. diameter of 6 requires a post. sagital of 9.
A transv. diameter of 5.5 requires a post. sagital of 10.

He also describes an "Index of the Outlet."

$$\frac{\text{Bis-ischial X Posterior sagital}}{2} \text{ equals index.}$$

$$\frac{11 \times 10}{2} \text{ equals 55, sufficient for normal spontaneous labor.}$$

$$\frac{7 \times 10}{2} \text{ equals 35, possible forceps.}$$

$$\frac{6 \times 9}{2} \text{ equals 26, usually forceps.}$$

An index below 25 is practically obstructive.

Evidence of moderate outlet contraction is an indication for lateral episiotomy, which may be extended as Schuchards incision lateral to rectum. Outlet contraction will give bad prognosis in breech extraction, will contra-indicate podalic version, and modify treatment of arrested occiput posterior or transverse position. Severe lacerations will be more frequent. The author believes that there is more practical value in outlet measurements than in those of the inlet.

A. L. McDONALD, M. D., F.A.CS.

A STATISTICAL STUDY OF THE INCIDENCE AND TREATMENT OF LABOR. COMPLICATED BY CONTRACTED PELVIS IN THE OBSTETRICAL SERVICE OF THE JOHNS HOPKINS HOSPITAL FROM 1896 TO 1924: J. W. Williams and Ko Chi Sun (American Jol. Obst. and Gyn. Vol. XI, No. 6). The study includes 14,000 patients of whom 11,630 gave birth to 11,925 children who had reached a period of viability. Of the 11,630 individuals, 6,407 were white and 5,223 were black, and there were 3,100 instances of contracted pelvis, including 577 with funnel pelvis. Contracted pelves were found in 8.96 per cent of the whites, and in 37.31 per cent of the blacks.

Rickets is important as cause of pelvic deformity in the colored but is much less so in the whites.

In studying the course of labor in 476 whites and 1,766 blacks it is noted that operative delivery is much more frequent in the whites. Also that the same degree of contraction causes dystocia much oftener in the whites. The frequency of operative delivery in relation to the diagonal conjugate is as follows:

Diagonal conjugate of 8.5 c.m. opr. 100 per cent whites, 95 per cent black.
Diagonal conjugate of 9.5 c.m. opr. 90 per cent whites, 68 per cent black.
Diagonal conjugate of 10.0 c.m. opr. 80 per cent whites, 52 per cent black.
Diagonal conjugate of 10.5 c.m. opr. 43 per cent whites, 23 per cent black.
Diagonal conjugate of 11.0 c.m. opr. 23 per cent whites, 15 per cent black.
Diagonal conjugate of 11.5 c.m. opr. 18 per cent whites, 8 per cent black.

In the simple flat pelvis the frequency of operative delivery is more frequent. With a diagonal conjugate of 9.5 c.m. operative delivery was necessary in 100 per cent of the whites. The authors regard the simple flat pelvis in the white as more serious in relation to the length of the diagonal conjugate than other types of deformity. They consider that other types of contraction are more or less associated with degeneration and smaller babies.

They note a greater frequency of premature rupture of membranes, prolapse of the cord and of abnormal presentations; breech, face, and shoulder. The figures given show a progressive decrease in both maternal and fetal mortality.

The relative frequency of various types of operative delivery has undergone considerable change during the period included in the study.

| | 1896-1905 | 1905-1910 | 1910-1924 |
|---|---|---|---|
| Low and mid forceps | 13.63% | 13.33% | 5.54% |
| High forceps | 15.15% | 1.67% | 4.08% |
| Version and Extraction | 36.36% | 25 % | 9.33% |
| Cesarean section | 22.73% | 18.33% | 64.43% |
| Pubiotomy | 1.52% | 40.00% | 3.50% |
| Destructive | 10.61% | 1.67% | 13.12% |

During the first period version and extraction was most popular, during the second, Pubiotomy was done most frequently, and since 1910 cesarean section has been the operation of choice. They find that the mortality of cesarean section is relatively high following a test of labor, and particularly if there have been attempts to deliver vaginally. They prefer the classical cesarean section for elective cases, the low double flap operation following a test of labor, and the radical operation with hysterectomy in doubtfully septic cases, or to sterilize.

A. L. McDonald, M.D., F.A.C.S.

*Pertussis Immunogen.*—A bacterial antigen obtained by agitating live pertussis bacilli with physiological solution of sodium chloride and separating the liquid from the organisms; the extract is free or nearly free from bacterial cells and toxin. There is some evidence that this material will yield approximately the same results as the ordinary pertussis bacillus vaccine (New and Non-official Remedies, 1925, p. 354). The product is marketed in 10 c.c. vials. Parke, Davis & Co., Detroit.

## PEDIATRICS

SUPERVISORS:
CHESTER A. STEWART,
LA SALLE BLDG., MINNEAPOLIS

ROY N. ANDREWS,
MANKATO CLINIC, MANKATO

HYPERTHYROIDISM IN CHILDREN: Robert S. Dinsmore, M. D., Cleveland, Ohio. (The third article in the Feb. number of Surgery, Gynecology and Obstetrics). The author first brings out that the incidence of hyperthyroidism in children is probably higher than would be supposed from the comparatively small number of cases which have been reported in the literature. He reports 48 cases, all occurring in children under 14 years of age.

Buford in a very exhaustive review of both foreign and American literature found only eight cases of exophthalmic goiter in children under five years of age and only eighteen cases in children under 12 years of age in a total series of 1,512 cases. In 1913, Lewis, of the Mayo Clinic, reported five patients all under 10 years of age. Cowden noted that exophthalmic goiter had not been reported in a male child under 10 years of age. In a series of 3,477 cases, Klein reports only 154 under the age of 15, and in this series the males were above 12 years of age. Bram, who has had a large experience in treating exophthalmic goiter, reports a series of forty-three patients under the age of 15, his youngest patient being just past her fifth birthday. Barrett reported one case only 2½ years of age. White reported a case of congenital Graves' disease, and Klaus, in 1914, reported the presence of hyperthyroidism in an infant of 9 months.

In the author's series of forty-eight patients, one patient was 5½ years old; one 7; two were 8 years of age; two 9; three 10; four 11; three 12; thirteen 13; and seventeen, 14 years of age. Among the males six were 14 and two were 11 years of age.

As far as etiology is concerned, heredity seems to play an important part. Climenko reported a series of cases in one family in which the mother, two daughters, and a child of each of the daughters, one a boy and the other a girl, had the disease. The mothers of eight of their patients had had goiters, and in at least two instances hyperthyroidism had also been present.

He concludes as follows:

1. Hyperthyroidism in children is perhaps more common than has been supposed and reported cases will undoubtedly appear more frequent in the future.

2. The etiology is unknown. A small percentage of the cases reported in the literature and also in this series, followed acute infection, but ordinarily there is no tangible factor to which the disease can be attributed. The onset is abrupt and the clinical course rapid. Induced hyperthyroidism may follow the prophylactic use of iodine in a small percentage of cases

but this can usually be controlled by the discontinuance of the iodin.

3. These children react quite unfavorably to all kinds of operative procedure and must be handled with extreme care.

4. In the presence of other foci of infection, the goiter should be removed first, the other foci of infection being removed after the patient has recovered from the thyroidectomy.

M. G. GILLESPIE, M.D.

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ULTRA-VIOLET RAY THERAPY IN TUBERCULOSIS OF CHILDREN—A RETROSPECT: Joseph H. Marcus, M.D., (Arch. of Ped., June, 1926). It is too frequently forgotten that sunlight contains besides heat and light, other forms of radiative energy very beneficial to the most hopeful forms of growth. The chemical rays of light increase the basal metabolism; stimulate cell activity; increase the cell content of blood; heighten the calcium and phosphorus contents of the blood; and possess certain phagocytic characteristics.

Regarding the influence of the ray upon the metabolic rate and blood chemistry, Denman had much experience and its effects are just as positive and almost as prompt as hypodermic medication. It penetrates the skin and enters the capillary circulation exciting positive chemical reactions in the blood.

Exposures given 3 times a week are quite satisfactory. In the author's experience from one to three months are necessary to arrest a case of pulmonary tuberculosis, depending upon the severity of the case.

Of the glandular forms, the mesenteric was most rapidly improved, next, the mediastinal, and last, the peripheral. Pulmonary tuberculosis of the miliary type remained uninfluenced by ultra-violet ray therapy even though it was begun early in the course of the disease.

Wright maintains that all forms of tuberculosis except pulmonary and meningeal are greatly improved by ultra-violet ray therapy. He contraindicates its use in active pulmonary tuberculosis and in tuberculous meningitis; bone and skin tuberculous adenitis and peritonitis, and pleurisy with effusion are among the forms most successfully treated, stressing the importance of fresh air, as an adjunct of the treatment.

Professor Axel Reyn, medical superintendent of the Finsen Institute, Copenhagen, in discussing the treatment of tuberculosis by artificial light, stated that 96 out of 114 patients suffering from lupus were cured, and the proportion of permanent cures was 90 per cent.

McKenzie has had satisfactory results with quartz light therapy in the treatment of lupus and local tuberculous conditions, such as tuberculosis of the knees, glands, hips and anal abscesses, tubular in origin.

Both Gauvain and Martin stress with unusual emphasis the great importance of heliotherapy in the treatment of surgical tuberculosis.

The ultra-violet light ray is of definite value for relief of symptoms in intestinal tuberculosis.

The author states that strikingly clinical results have been obtained by the aid of actinotherapy, the conditions so treated being rickets, spasmophilia, eczema (light therapy, as an adjunct) and peribronchial adenitis, secondary to measles, pertussis, influenza and pneumonia.

Ultra-violet ray therapy, while not specific, is the most valuable recent contribution to the treatment of certain types of tuberculosis, and should not be used as a distinct and separate entity.

It is the duty of the physician to educate the people to the new knowledge of sunlight, both natural and artificial, as a means of health, teaching, that it is a stimulant, a tonic and nature's universal disinfectant.

R. N. ANDREWS, M.D.

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## EYE, EAR, NOSE AND THROAT

SUPERVISORS:
VIRGIL J. SCHWARTZ,
PHYS. & SURG. BLDG., MINNEAPOLIS

E. L. ARMSTRONG,
FIDELITY BLDG., DULUTH

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CYANOSIS RETINÆ IN ERYTHROMELALGIA: F. Phinizy Calhoun, M.D., Jackson Birthday Volume. Retinal cyanosis, previously noted in congenital heart disease and in polycythemia vera, is now found in a case of vasomotor disturbance of the extremities. This condition (erythromelalgia) is a chronic disease in which there are pain, redness and heat of one or more parts, usually extremities, and these manifestations are aggravated if the parts hang down, as in the erect posture. There are thought to be changes in the anterior or posterior horns of the gray matter in the cervical and lumbar parts of the spinal cord; toxemias or infections may also be factors.

As a peripheral neuritis involving the vasomotor nerves it may be associated with angioneurotic edema and Raynaud's disease. Marked compensatory changes have been found in the intima of vessels leading to the diseased area, with consequent narrowing of the lumen. These are the results of a previous long-standing distention of vasomotor paralysis of these vessels.

The author's patient complained of sharp pains, redness, itching and burning of feet, then both hands, then gluteal regions, these evidences being more marked on standing.

The blood pictures over two years showed a high percentage of hemoglobin (102-110 Dare), a high red-cell count (about 6,000,000), 12,000 to 24,000 leucocytes with polymorphonuclear increase, and later a few myeloblasts and nucleated red cells—altogether not a polycythemia vera.

There were no subjective eye disturbances, and none objectively except for the retinas, which were alike in the two eyes.

The fundus generally was a deep, brick-dust red. The temporal disc-margins were clear but the nasal were blurred, suggesting mild edema. There was great increase in the size, number and tortuosity of the retinal vessels, especially the veins. The arteries were darker

and larger than normal, and the light streak was abnormally prominent; capillaries also were enlarged and tortuous.

The veins were tremendously dilated, purplish-black, not unlike a mass of worms, with great ectasiæ which seemed about to break, but no hemorrhages were ever seen. The engorgement increased on changing *from the erect to the recumbent position,* so that the only plausible explanation seems to be *a venous and arterial stasis within relaxed vessel walls due to a vasomotor constrictor paralysis.* The mild nerve edema may be due to increased blood viscosity, which would favor stasis within the nerve, which would in turn compress the neural part of the vein and so impair the retinal return circulation. This, then, might enhance the venous dilatation and tortuosity.

VIRGIL J. SCHWARTZ, M.D.

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ON THE SIMULTANEOUS AND SUDDEN OCCURRENCE OF UNILATERAL BLINDNESS AND CEREBRAL LESION: Harry Friederwald, M.D., Baltimore, Maryland, Jackson Birthday Volume. The usual cause of sudden unilateral blindness in persons of advanced age is thrombosis of the central retinal artery. The presence of optic atrophy, of marked changes in the retinal arteries, and of general vascular disease are indices to the nature of the condition. When a thrombosis occurs at the same time in the central retinal and one or more of the cerebral arteries, particularly the middle, there will be added to the blindness a number of other symptoms.

In thrombosis there is a diseased vessel wall with a narrowed lumen, through which, however, sufficient circulation to insure a functioning retina may continue for a considerable period, when, suddenly, blindness sets in. This is caused either (1) by total occlusion of the lumen, through thickening of the inner layers of the wall or spasm of the muscle layer, or (2) by failure of a lowered blood pressure to propel the blood through the constricted channel.

The first of three illustrative cases had had a systolic blood pressure ranging from 200 to 240 over some time, with headache and weakness; then a momentary loss of vision of both eyes, which recurred a day later, followed in a few days by an attack which left the left eye amaurotic. There was a left optic atrophy, and marked arterial narrowing with arterio venous compression in both eyes. There was complete loss of half the left visual field, so a diagnosis was made of simultaneous thrombosis of the left central artery and of the right occipital hemisphere.

The second patient, about 55 years of age, suffered with "doubled" vision of the left eye and blindness of the right. This came suddenly with vomiting, dizziness and unconsciousness. Except for a high hyperopia the left eye was negative; the right eye, however, showed marked optic atrophy and arteries of very irregular caliber. Arteriosclerosis with chronic nephritis and a fibrillating heart were found.

The age, arteriosclerosis, the fundus picture in each case point definitely toward a central artery thrombosis as the cause of the sudden blindness; temporary complete blindness, as in the former case, is occasionally seen in cortical hemianopsia. The apoplectic cerebral symptoms point toward a co-existent cerebral thrombosis.

A third case had had an attack of sudden mental cloudiness, paralysis of the right arm and leg, aphasia, and blindness of the left eye. There was marked left optic atrophy with greatly contracted vessels, as in embolism of the central artery. Since there was no general arteriosclerosis and no pathology in the vessels of the right eye, there was probably present here not a thrombosis but either an embolism or cerebral hemorrhages.

VIRGIL J. SCHWARTZ, M.D.

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ON THE INTRACRANIAL EXTENSION OF OPTIC NERVE TUMORS: Arnold Knapp, New York. (Jackson Birthday Volume). Primary optic nerve tumors which seem confined to the orbit may often extend into the cranial cavity. Byers and Hudson found forty cases out of a hundred ninety-one to present intracranial involvement. Twenty-one out of twenty-three postmortem examinations of diagnosed cases showed an intracranial tumor, but never a local (orbital) recurrence. Extension took place into the intracranial part of the affected nerve, the chiasm, the opposite nerve and the brain. Cases of optic nerve tumor have been observed for twenty-four years after operation without signs of intracranial involvement. Gliomas may be of varying malignancy—some slowly progressive, other rapid.

The x-ray may be used by Rhese's method, to see whether or not the optic canal and foramen are enlarged by a tumor. Measurements may be thus made for comparing the right and left sides.

The author reports four cases of glioma ranging from 4 to 52 years of age operated by him within a few years using the Krönlein method. Three of these cases showed a complete or developing secondary optic atrophy in the involved eye, with little or no remaining vision in this eye, and *a very definite enlargement of the optic canal of the corresponding orbit.* The fourth case is entirely free from orbital or intracranial symptoms after eleven years, and there is no enlargement of the optic canal nor of the pituitary fossa.

Treatment is very difficult; of course, while localized in the orbit, removal of the tumor is indicated; but when intracranial extension shows itself, gliomata are practically inoperable.

VIRGIL J. SCHWARTZ, M.D.

# BOOK REVIEWS

## BOOKS RECEIVED FOR REVIEW

AMERICAN RELIEF ADMINISTRATION BULLETIN. Series 2, No. 45, April 1926. American Medical and Sanitary Relief in the Russian Famine, 1921-1923. With chapters on Russian Medical Practice, Epidemics, Deficiency Diseases and Famine Manifestations. Henry Beeuwkes, M.D., Medical Director, American Relief Administration, Russian Unit. 128 pages. 101 illus. 9 charts. New York: American Relief Administration, 42 Broadway, 1926.

HAY FEVER AND ASTHMA. A practical Handbook for Hay Fever and asthma patients. Ray M. Balyeat, A.M., M.D., Instructor in Medicine, University of Oklahoma, etc. 198 pages. 27 illus. Cloth, $2.00. Philadelphia: F. A. Davis Company, 1926.

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THE PRINCIPLES AND PRACTICE OF ENDOCRINE MEDICINE, William Nathanial Berkeley, Ph.D., M.D., Recently Attending Physician at the Good Samaritan Dispensary, New York. Cloth. Price $4.50. Pp. 368, with 60 illustrations. Philadelphia: Lea & Febiger, 1926.

This book covers, briefly and yet thoroughly, the entire field of endocrinology. Only the known facts are included, and all speculation, if discussed at all, is given only short consideration. Each gland is taken up individually, and its anatomy, physiology, and pathology is considered. There is a chapter on the inter-relation between the different glands and one on pluriglandular disease. The book is interestingly written, and one that is well worth the busy practitioner's time.

A. N. BESSESEN, JR., M.D.

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CONCEALED TUBERCULOSIS OR THE TIRED SICKNESS. George Douglas Head, M.D. 137 pages. Illus. Cloth, $2.00. Philadelphia: P. Blakiston's Son & Co., 1924.

This text describes a type of sick person which has given concern to almost every practitioner of medicine. Dr. Head's description and discussion indicate not only broad experience, but also keen analysis and discernment.

He divides the symptoms into four groups, with reference to the predominating complaint: (1) chest pain, (2) nervous exhaustion, (3) cold and cough, (4) abdominal distress.

The value and also the limitations of physical examinations are brought out. In differential diagnosis, the more common conditions which may be confused are discussed, such as syphilis, myocarditis, gastric and duodenal ulcer and hyperthyroidism.

There is a short chapter on management; also considerable space is given over to case histories.

This book is written in the comfortable easy style so characteristic of the author and deserves a place in every physician's library. L. R. CRITCHFIELD, M.D.

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